



41 Solutions for Home or the Road

- ▶ Dial In from Anywhere
- ▶ Supercharge Your Contact Lists

NETWORK EDITION

First Looks PowerPC Goes Windows; First Mac Clone

Stay Connected PC Labs Reviews 22 Remote Solutions

PC LABS TESTS 80 COLOR NOTEBOOKS

Portables

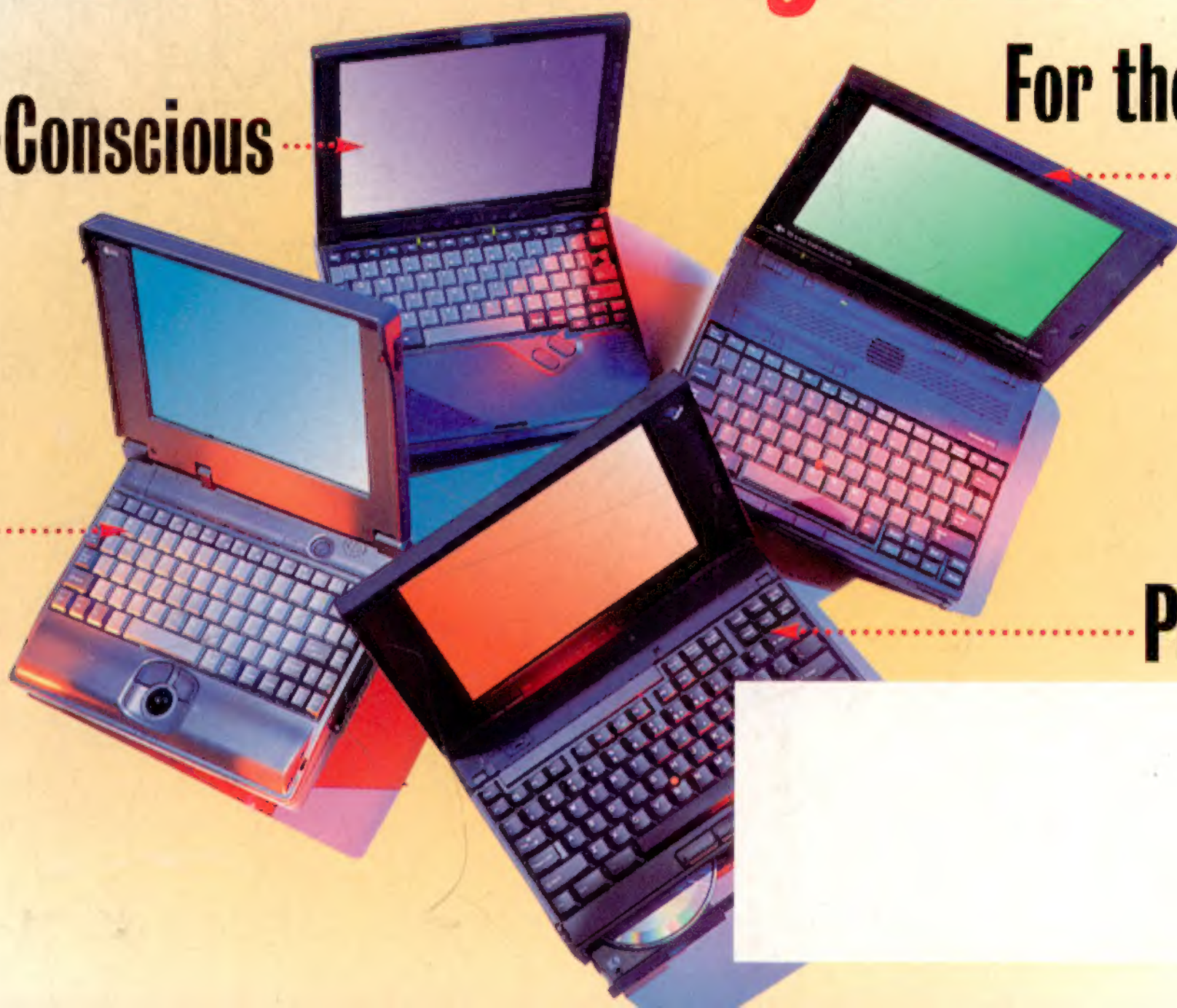
For Everyone

For the Weight-Conscious

For the Power-Hungry

For the Value-Driven

For the Mobile Presenter



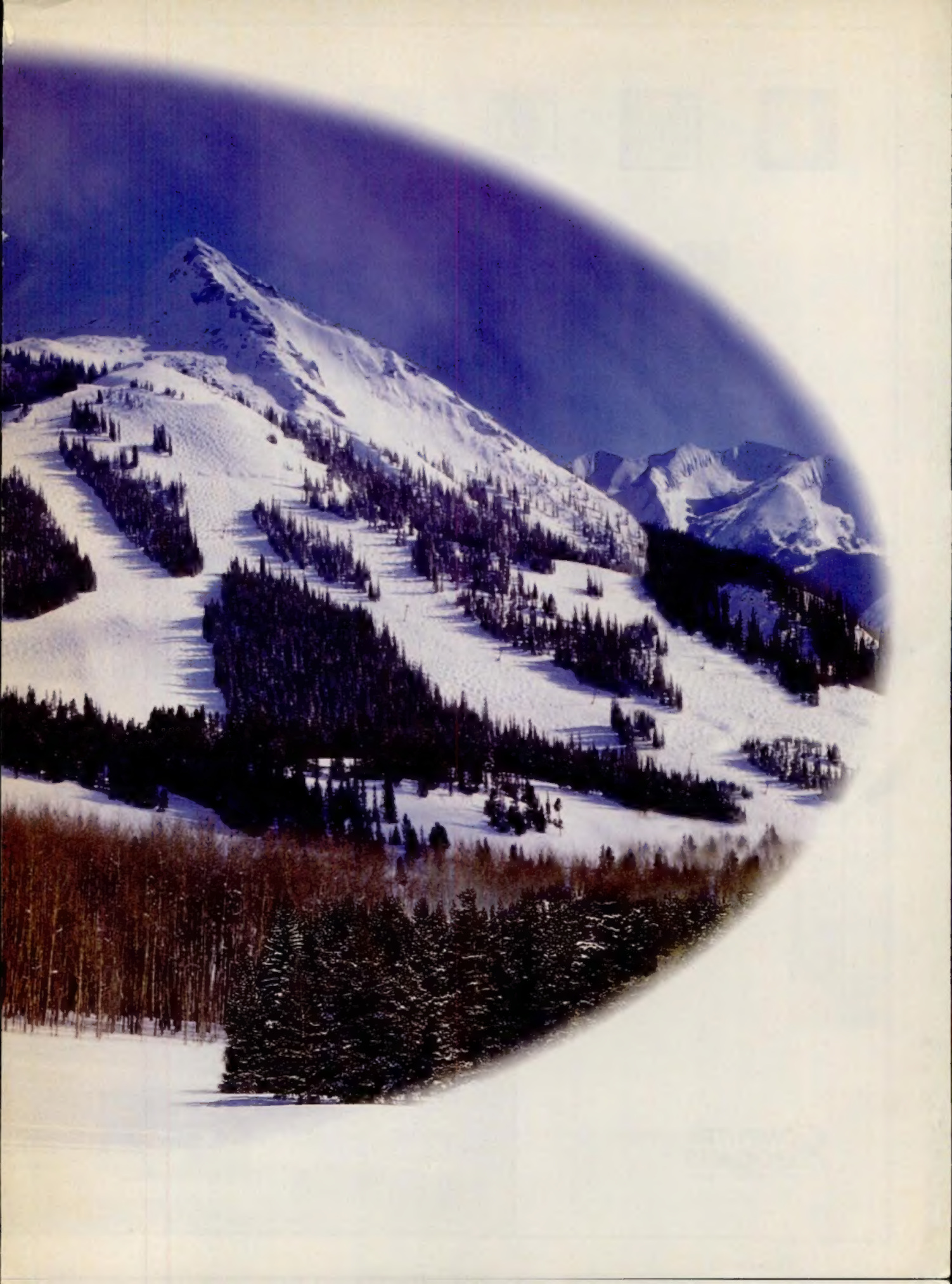
THEIR SKIS
PLUNGE OVER
THE EDGE

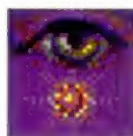
THEY CARVE
THEIR WAY DOWN
THE SLOPE

THEIR
GLIDING WEDGES ARE
CLEAN AND CRISP

THEY BRUSHED THAT
LAST PINE TREE SO CLOSE
IT TICKLED
THEIR SPINES

AND THAT
FRIGHTENS ME
A LITTLE





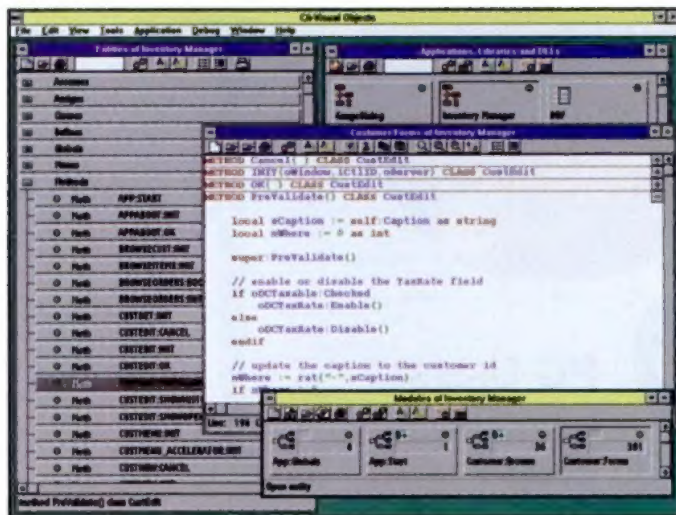
Developers: Bet You Haven't Xbase Like



Highly informative business applications
can also be great-looking.



COMPUTER ASSOCIATES
Software superior by design.



It's easy to create Windows applications with browsers and editors that design and manage the process.

Seen This Before.

With CA-Visual Objects®, developing new applications is a sight to behold. Because for the first time, the ease of use of visual programming has been married with the fourth generation power of an Xbase language.

The result is the only application development tool that gives you full object orientation, GUI support and client/server architectures combined with existing Xbase technologies and databases.

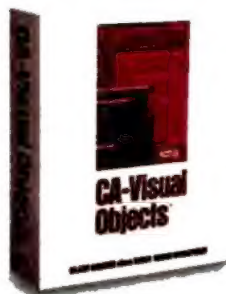
And the advanced technology of Visual Objects doesn't stop there. The object orientation includes inheritance, polymorphism and encapsulation. And the native code compiler boasts an engine that drives Visual Objects at a speed that's as fast as lightning.

Plus, the repository-based interactive development environment includes class browsers, painters, editors and prebuilt classes.

For More Information, Call 1-800-225-5224, Dept. 14007.

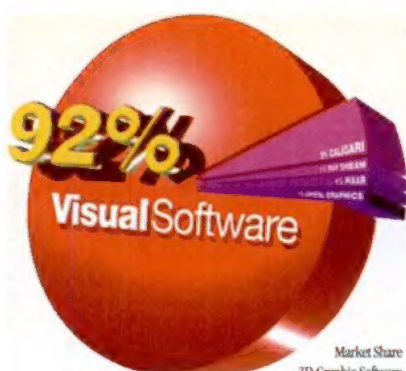
Phone soon for a closer look at new CA-Visual Objects. Your mind won't believe what your eyes are seeing.

**Mission-Critical
Client/Server
Repository-based
Native Code Compiler
Fully Scalable
Class Libraries
OOP**



New CA-Visual Objects®

© Computer Associates International, Inc., Islandia, NY 11788-7000 "Light Lib" graphic developed in conjunction with Light Lib Business for Windows from DFL Software, Inc. All products referenced herein are trademarks of their respective companies.



Market Share
3D Graphic Software
PC Data Retail Report
March 1995

OVERWHELMING

**PC Users
Choose
Visual
Software
for 3D
Graphics**



**Simply 3D
Graphics
for Everyone**
OUR
BEST
SELLER



**Simply 3D
SuperPack**
Simply 3D Plus 3D
Worlds, 3D Glasses
and More!



**Visual Reality
1.5**
The Affordable
Suite of Tools for
3D Graphics and
Animations



**Visual Reality
2.0**
Professional 3D
Graphics and
Animation
Solutions

FREE



CD ROM

Call **800/881.4108**
or Visit Us On
CompuServe—
Just **GO VISSOFT**

Available at Fine
Retailers Everywhere



CIRCLE 026 ON READER SERVICE CARD

Inside

Faster, cheaper, lighter” has been the mantra for all of our Portable PC issues since we first started reviewing portables in the mid-1980s. This issue adds new dimensions to those words. As a matter of fact, 20 of the 80 portables we review in

“Your Portable Persona” are Pentium-based, and both the prices and designs of these machines are more aggressive than ever.

But there’s another side to this year’s roundup: the diversity of today’s portables market. To help you find the best fit, we’ve divided the reviewed units into four very different market segments.

The diversity of machines was strikingly apparent to anyone walking through the labs during testing. This variety is also apparent in the latest issue of PC Magazine CD (Volume 3, Number 2). Executive editor Peter McKie and his team, including art director Curtis Fields, have made the multimedia elements of this disk better than ever.

Like previous issues, this CD is meant to be a companion to our print magazine; it contains a full year of back-issue text plus ScreenDemos where our reviewers walk you through today’s software. For instance, this issue high-



lights a series of ScreenDemos exploring Microsoft Windows 95.

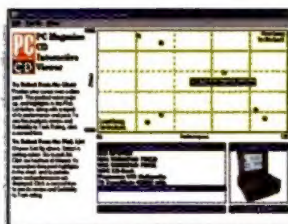
As you dig deeper, other elements of the CD reveal the many levels of the PC market.

You’ll see our Benchmark Test Results Viewer, created with our colleagues at Ziff-Davis Benchmark Operation. This lets you see all the benchmark tests for all of the machines we reviewed and sort the machines by score. You can also “drill down” to a particular machine and access hundreds of data points on it. This is far more detail than we could ever fit into the print publication. Another way of looking at the data is via an interactive price/performance chart, largely developed by PC Labs project leader Jay Munro.

And of course, the CD offers videos showing the highlights of each comparative review. (For more details, call 800-335-1195.)

PC Magazine CD is one more way that we can help you tackle the diversity in this market.

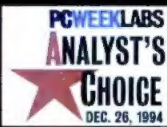
—Michael J. Miller



**PC Magazine CD gives us new
ways to explore the huge
amount of data we collect.**

PC Magazine: The Independent Guide to Personal Computing, ISSN 0888-8507, is published biweekly except in July and August, for \$49.97 for one year. Ziff-Davis Publishing Company, L.P., One Park Ave., New York, NY 10016-5802. Second-class postage paid at New York, NY 10016-5802 and at additional mailing offices. POSTMASTER: Address changes to PC Magazine, P.O. Box 54093, Boulder, CO 80322-4093. GST Registration Number: R-123609673. Canada Post International Publications Mail Product (Canadian Distribution) Sales Agreement No. 266477.

Practically Speaking, We've Built A Better Sling Shot And We've Got The Awards To Prove It.



When it comes to performance and price, Practical beats Megahertz, the Goliath of modems. Once again, Practical's your best **value** with our new PROCLASS™ 288 Data/Fax modem with EZ-Port™.

According to PCWEEK, "excellent



performance buttressed by outstanding power management makes the PROCLASS a winning choice-especially given its price."

PROCLASS gives you:

- DTE speeds up to an incredible 230,400 bps, not just 115,200 like Megahertz
- Uses 90% less battery power in auto-idle mode
- V.34 and V.FC compatible
- Rugged, pop-out telephone connector called EZ-Port
- Enhanced "16650" UART to help prevent data loss

BYTE Magazine wrote "the modem ran extremely well, finishing first in our PC Card fax testing." And COMPUTERWORLD readers voted Practical the best PCMCIA modem for Price/Performance. With all these advantages, isn't it time you got Practical? For literature, call PRACTIFAX at 800-225-4774 and select Document #3090.

For our Corporate Evaluation Offer, call 800-934-2937, Ext. 270.

PRACTICAL PERIPHERALS®

5 Year Limited Warranty ♦ Technical Support
7 Days A Week ♦ Data/Fax Software Included
♦ Made In The USA

©1995 Practical Peripherals. Practical, the Practical Peripherals logo, PROCLASS, and EZ-Port are trademarks of Practical Peripherals, a division of Hayes Microcomputer Products, Inc.

CIRCLE 120 ON READER SERVICE CARD

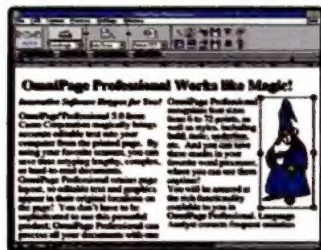
OmniPage Pro. Think of it as an accurate 1500 wpm typist who never takes a coffee break.



Try this powerful OCR software just once, and you'll never go back to retyping documents again.

Nobody likes wasting time typing letters, faxes and reports back into a word processor. That's why OmniPage® Pro Optical Character Recognition (OCR) software is so valuable to scanner users. It's faster and more accurate than even the fastest typist. ■ OmniPage Pro reads through each page, recognizing text in any font, from 6-point fine print to 72-point headlines. It intelligently analyzes the document for context and spelling, making smart decisions on

hard-to-read characters. It's the most accurate OCR software yet. ■ Easily edit and format documents within OmniPage Pro, or in your favorite word processor. It's fully customizable, so you can tailor OmniPage Pro to your individual needs. Or train it to recognize special characters and symbols. You'll save lots of time and thousands of keystrokes. ■ Even the most complex layouts are no problem, because OmniPage Pro excels at handling both text and graphics on the same page. And it features Image Assistant®, an integrated 24-bit color image editor. ■ So try OmniPage Pro today and stop retyping.



OmniPage Pro captures page layout, editable text and graphics just as they appear in your original document.

TRADE UP

from your scanner's OCR software! Only **\$149***

from any version of OmniPage, WordScan, or OmniScan SE, including the OCR bundled with your scanner.

Get these powerful new features:

- Increase accuracy with innovative neural network and Language Analyst™ technologies
- Retain original text and graphic layout with exclusive TruePage™
- Easily edit graphics with fully-integrated, 24-bit color Image Assistant
- Improve recognition of hard-to-read documents with 3D OCR™ and customizable OCR training
- Achieve greater fax recognition automatically with AnyFax™

*Suggested price

Call 1-800-535-SCAN ext. 10



OmniPage Pro.
Never retype another document.



Caere, the Caere logo, Image Assistant and OmniPage are registered trademarks of Caere Corporation. 3D OCR, Language Analyst, AnyFax and TruePage are trademarks of Caere Corporation. All other registered trademarks and trademarks are property of their respective companies. © 1995 Caere Corporation. All rights reserved.

CIRCLE 292 ON READER SERVICE CARD

UP FRONT

Inside

A portable for all reasons.....4

Letters

Have you had an out-of-box experience?.....19

Trends

- Photonics PCs
- CD-Revolution
- Apple's day in the sun
- The new Internet29

First Looks

- RAM Doubler for Windows
- **Power 100**
- UnInstaller 337



Control your PC from across the room with PowerControl (page 44).

New & Improved

BY ASA SOMERS.....61

Read Only

EDITED BY TIN ALBANO69

COLUMNISTS

Michael J. Miller

[The Windows 95](#)
FAQ File.....75

Bill Machrone

Digital Art Isn't.....83
Second Looks.....85

John C. Dvorak

Note to IBM: Sell the OS/2
Division.....89
Inside Track.....91

Jim Seymour

Fix 'Em or Forget 'Em93

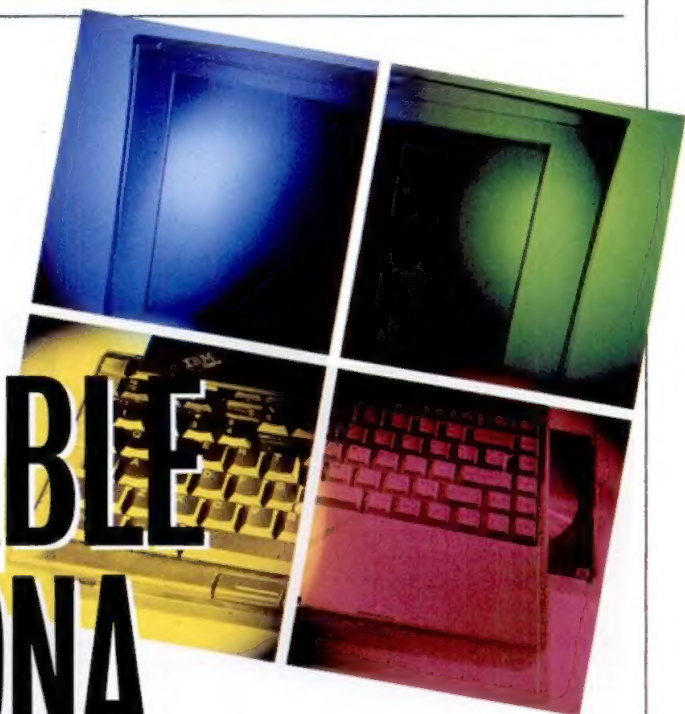
Bill Howard

When the Bits
Hit the FAN95

COVER STORY

Notebooks

YOUR PORTABLE PERSONA



BY BILL HOWARD What did we find from putting 80 notebooks through their paces at PC Magazine Labs? Full-featured notebooks with Pentiums now rival the capabilities of desktops; multimedia notebooks with integrated CD-ROM drives are an affordable reality; and new notebooks are pushing the envelope, packing even more features into ever-smaller packages....102

Vendors of products reviewed:

Altima Systems Inc.117	Everex Systems Inc.182
AMS Inc.121	FutureTech Systems Inc.182
ARM Computer Inc.125	Gateway 2000 Inc.184
Aspen Computer Inc.125	Hewlett-Packard Co.186
AST Research Inc.149	HyperData
Astro Research Inc.149	Technology Corp.186
AT&T Global	IBM Personal Computer Co.186
Information Solutions153	Maximus Computers Inc.188
Austin Direct153	MaxTech Corp.190
Broadax Systems Inc.154	Micro Express190
Canon Computer Systems Inc.154	MidWest Micro190
CTX International156	MPC Technologies Inc.197
Dell Computer Corp.156	NEC Technologies Inc.197
DFI Inc.160	Novacor Inc.199
Digital Equipment Corp.160	

Epson America Inc.167	Panasonic Personal
Ergo Computing Inc.182	Computer Co.199
	Sager Midern Computer Inc.202
	Samsung Electronics
	America Inc.202
	Sceptre Technologies Inc.204
	Sharp Electronics Corp.204
	Texas Instruments206
	Toshiba America
	Information Systems206
	Twinhead Corp.207
	Unisys Corp.207
	Wedge Technology Inc.210
	WinBook Computer Corp.212
	Zenith Data Systems212
	ZEOS213

Panasonic Personal	Computer Co.199
Sager Midern Computer Inc.202	
Samsung Electronics	
America Inc.202	
Sceptre Technologies Inc.204	
Sharp Electronics Corp.204	
Texas Instruments206	
Toshiba America	
Information Systems206	
Twinhead Corp.207	
Unisys Corp.207	
Wedge Technology Inc.210	
WinBook Computer Corp.212	
Zenith Data Systems212	
ZEOS213	

Notebooks

Special Insert: Road Warriors' Companion

With so many choices, how do you figure out which is the perfect match for your individual needs? We help you explore the possibilities.....141

Hardware

PORTABLE PRINTERS:
FEWER TRADE-OFF

BY BRUCE BROWN A portable printer can be the perfect companion to your laptop PC, but only if the output is first-rate and the unit is light enough not to be a bother. In our look at seven of the latest portable printers, we find you can get fine print quality and even good color output from printers that weigh as little as 2 pounds215

Products reviewed:

Canon BJC-70.....	225
Citizen PN60.....	228
DECwriter 90ip.....	230
HP DeskJet 320.....	232
Mannesmann Tally MobileJet.....	230

Olivetti JP50.....	230
Pentax PocketJet.....	240
Editors' Choice.....	216
Performance Tests.....	228
Summary of Features.....	234
Monochrome Output Guides.....	238
Color Output.....	240

Software

SHARING THE WEALTH

BY KEVIN REICHARD AND KATHY YAKAL When we last reviewed contact managers, most were single-user programs. Today's contingent, however, are heavily into networking: sharing the wealth of contact information and gaining synergy for the entire workgroup. Benefits include easy group scheduling and remote data synchronization. We review 11 contact management products and five networked PIMs243



Products reviewed:

Ace for Windows 3.0.....	251
ACT! 2.0 for Windows.....	252
Action Plus for Windows 1.51.....	254
Commence 3.0 Personal Information Manager.....	257
GoldMine for Windows 2.5a.....	260
Janna Contact 2.0.....	263
Maximizer 3.0 for Windows.....	269

Networking

THE ART OF REMOTE ACCESS

BY FRANK J. DERFLER, JR. Remote access is showing up everywhere as new products are making it easier for roaming users to link to the home office. Although today remote-node and remote-control solutions are considered distinct, they are converging in new ways. We test 9 remote-control software packages and 13 remote-node server products.....279



Access and Control280

Products reviewed:

Carbon Copy for Windows 2.5b.....	282
Close-Up 6.0.....	283
CoSession for Windows 2.0g.....	283
KopyKat 1.1.....	286
LapLink for Windows 6.0a.....	290
The Norton pcAnywhere 2.0 for Windows.....	292
PolyPM/2 3.0.....	294
ReachOut 5.0 for Windows & DOS.....	295
Remotely Possible/Dial 4.0.....	296
Editors' Choice.....	282
And Now for the Megairon.....	290
Modem Central: A Remote- Control Alternative.....	292
Performance Tests.....	294
Summary of Features.....	296
Timbuktu Pro for Windows.....	299
Remote Node: Hello, LAN.....	301
Products reviewed: Attachmate RLN Turnkey Server.....	303

Cayman Gator Access MP.....304

Cisco 2509 Access Server308

IBM LAN Distance
Connection Server308

LAN Access LAN/4e310

Microcom LANexpress 4000.....315

Multi-Tech MiniArray Turn-Key
Communications Server
MA8ER/HD316

RAD MBE-RAS.....316

Shiva LanRover/E
PLUS 3.5.....318Stampede Remote Office
Communications Server.....318

Telebit NetBlazer PN4DE.....321

3Com AccessBuilder 2000.....323

Xylogics Remote
Annex 2000.....325

Editors' Choice.....303

Remote Access Meets
the OS310

Performance Tests.....312

Summary of Features.....320

The NLM Option: NetWare
Connect and WanderLink.....326

SuperOffice 3.0270

TeleMagic Enterprise
for Windows 1.5.....272

Tracker for Windows 2.0.....274

WinSales 2.1.....275

Editors' Choice.....245

Ecco Professional 2.0.....251

Info Accelerator 3.0.....253

Networked PIMs.....256

Summary of Features.....262

NETWORK EDITION

Follows page 96

Cover Story

BBS Software	NE1
•PCBoard v15.21	NE13
•Wildcat! 4.1	NE16
•Worldgroup, Version 1.0	NE17

First Looks

CD-ROM Servers for NetWare	
Microtest DiscPort Tower	NE25
SciNet CD System	NE26
ProShare Video System	
200, Version 1.8	NE25

Microtest DiscPort Pro	NE26
BrightWorks 2.01	NE34
Saber LAN Workstation 5.0b	NE36
HP JetDirect EX Plus3	NE40
Norton AntiVirus	
for NetWare 2.0	NE40

New & Improved

WebManage	NE47
Internet NOW	NE47
Watcher II	NE47
Internet Office 4.0	NE47
Cisco 2517 Router/Hub	NE47
Express Meter 3.0	NE48

Kane Security Analyst	NE48
Axis 851/951 Network	
CD-ROM Server	NE48
Redwood	NE48
CU-SeeMe	NE50
S-Bridge NT	NE50

For the Worker

BY DIANE DANIELLE	
Spread the Risk	NE45

More Access

BY STEVE BUEHLER	
Simpler Rocket Science	NE50

PC TECH

User-to-User

PC MAGNET BY NEIL J. RUBENKING
A batch file that capitalizes text using DOS's FC command; a version of 2.BAT that works under WfWG with 32-bit file access enabled; capturing full screens with Paintbrush.....327

Extending Your Apps

PC MAGNET BY M. DAVID STONE
Setting Up a Small-Office Invoicing System.....329

Power Programming

PC MAGNET BY RAY DUNCAN
Publishing Databases on the World-Wide Web.....403

Utilities

PC MAGNET BY MICHAEL J. MEFFORD
WCompare: File Matchups Made Easy.....413

PC SOLUTIONS

Hardware

Is the 10-foot limit on parallel printer cables a bugaboo? Adding multimedia capability to your laptop.....421

Operating Environments

Fixing your Windows swap file; checking whether there's enough disk space...421

Word Processing

Use WordArt to rotate and reshape text in WinWord tables.....432

Spreadsheets

Mimicking 1-2-3's {down} macro command in Microsoft Excel; printing all the formulas in a 1-2-3 for Windows worksheet.....436

Databases

Creating a progress thermometer in your Access Basic programs.....436

Graphics

Getting rid of irregular spacing in PageMaker documents.....444

AFTER HOURS

Hot Adventures or Cool Movies: You Decide

- **CD-ROM Pick Hit:** Xplora 1: Peter Gabriel's Secret World
- **Action:** Descent
- **Spotlight on Adventure:** Johnny Mnemonic
- **Kids:** The Incredible Machine 2
- **Quick Clips**.....535

Abort, Retry, Fail?

BY DON WILLMOTT.....544

ALSO IN THIS ISSUE

PC Direct	421
Marketplace	491
Premier	491
Classified	507
BusinessCard	524
Reader Service Card	511
Advertisers' Index: Companies.....	529
Advertisers' Index: Products.....	530
Coming Up	532
Editorial Product Index	533

Check out the latest in interactive movies (page 535).



COLOR.



Hands-down the best low-cost color printer we found.
—*Entrepreneur*

★ BEST OF ★
BYE
Computer Bytes

the output is astonishing for the price.
—*Digital World*

At 720 dpi, it provides by far the best output of any printer in its class.
—*PC World*

Talk about pushing the envelope.
—*PC Magazine*

What more do you need in a color printer?
—*Computer Life*

COOL

MAKING

1994

To bring the best out of your EPSON Stylus COLOR printer, insist on genuine EPSON ink cartridges.

WOW!

"Out of a fleet
of color ink
jets, the Epson
Stylus Color soars
above the rest."
-InfoWorld

"Get ready to be
wowed by the
sharpness of the
images and the
vividness of
the colors."
-Home Office Computing

"Offering high-
quality prints of
photographic
images at an
unheard-of price."
-MacUser

"Epson has set
a new standard
with its first
ink-jet color
printer."
-Wired Magazine

"...The vivid out-
put and excep-
tionally crisp
text are hard
to pass up."
-PC Magazine

The Amazing, Affordable EPSON Stylus COLOR Ink Jet Printer.

EPSON

1.800.BUY.EPSON
EXT. 3037



720 dpi printing requires EPSON coated paper (12.5¢/sheet). Price may vary. Also prints 360 dpi on plain paper. EPSON and EPSON Stylus are registered trademarks of Seiko Epson Corp. All other trademarks or registered trademarks are the properties of their respective holders. ©1995 EPSON AMERICA, INC. 20770 Madrona Ave., Torrance, CA 90503. For dealer referral or warranty details, in the U.S. or Canada call 800-BUY-EPSON (800-285-3778). For Latin America, Call 305-285-0082.



Editor-in-Chief Michael J. Miller

Editor Robin Raskin

Executive Editors Rick Ayre, Bill Howard, Don Willmott

Executive Director, PC Labs C. James Galley III Art Director Laura Baer

Senior Networking Editor Frank J. Derfler, Jr.

Senior Editors David Greenfield (Networking and Communications), Thomas Mace (PC Tech, Applications Development), Brian Nadel (First Looks), Sebastian Rupley (West Coast)

Managing Editor Paul B. Ross

Senior Associate Editors Ted Stevenson (Software), Sharon Terdeman (Technical Columns) **Associate Editors** John Clyman (PCs), Gayle C. Ehrenman (After Hours), Leon Erlanger (Hardware), Carol Levin (Trends), Gail Shaffer (Networking and Communications), Lance N. Ulanoff (Graphics) **Technical Editor** Neil J. Rubenking **Senior Production Editor** Kim Schueler **Production Editor** Monica Sirignano **Copy Chief** Glen Boisseau **Becker Staff Editors** Tin Albano, Eryn R. Brown, Jamie M. Bsates, Kathleen Caster, Elisabeth H. Holzer, Ellyn J. McCasland, Michael W. Muchmore, Todd Spangler, Sarah L. Roberts, Michael Ryan, Craig L. Stark, Carol A. Venezia, Leslie Wygant, Anush Yegyzarian **Senior Writer** Robert S. Anthony **Staff Writer** William P. Flanagan **Assistant Editor** Asa Somers **Senior Copy Editors** Jeanne Albrecht, Jill Léger **Copy Editors** Elliot Thomas Grant, Joseph N. Levine, Ann Ovodow, Tracy Reppert **Assistant Copy Editors** Marian Berelowitz, Peter J. McLaughlin **Layout Manager** Linda Harms **Senior Layout Editor** Lillian Gaffney **Layout Editor** Shari L. Girouard **Library Assistant** Dolores Williams **Editorial Assistant** Melissa J. Perenson **Senior Editorial Researchers** Brad Stilwell, Jodi L. Wynblatt **Editorial Researchers** Mary E. Behr, Yvonne Koulouthros, Cade Metz, Gregory Sewell **System Support Manager** Craig Ellison **PC Support Analyst** Melvin Acevedo **Production System Support Manager** Patricia Perkowski **Production System Support Analyst** Thomas DeVito **Communications Manager** Diana Garelik **Assistant to the Editor-in-Chief** Tara Solon **Assistant to the Editor** Rita Arahamian **Assistant to the Executive Editors** Christina M. Evelyn **Administrative Assistant** Christina Okang Sysop, **PC MagNet** Ken Hipple

Contributing Editors Bill Machrone (VP, Technology), Douglas Boling, Bruce Brown, Brian Butler, Sheryl Canter, Diane Danielle, Ray Duncan, John C. Dvorak, Michael J. Mefford, Edward Mendelson, Charles Petzold, Alfred Poor, Jeff Proise, John R. Quain, Sal Ricciardi, Steve Rigney, Winn L. Rosch, Joe Salemi, Jim Seymour, Richard Hale Shaw, Barry Simon, Luisa Simone, Craig Stinson, M. David Stone

Senior Associate Art Director Donna Panagakos **Associate Art Directors** Charles Conover, Richard Demler **Assistant Art Director** Le Chau (Betty) Thai **Associate Graphics Director** David Foster **Graphic Artist** Mark Tyner **Assistant to the Art Director** Frieda T. Smallwood **Contributing Photographer** Thom O'Connor

Director, PC Labs, West Coast Steve Buchler **Technical Directors** Ben Z. Gottesman (Software), Robert P. Lipschutz (Networking and Communications), Nick Stam (Hardware) **Director, Operations** John R. Delancy **Project Leaders** Richard Fisco (PCs), Thomas Kreyche (Client/Server), Jeff Mace (Graphics), Jay Munro (Applications Development), Jeffrey G. Witt (Networking and Communications), Michael J. Zulich (Hardware) **Programmers** Richard V. Dragan, Kenneth Prakobchart **Product Testing Manager** Charles Rodriguez **Senior Technical Analysts** John Garris, O. Ryan Tabibian **Technical Analysts** Alan Chan, Laura Cox, Tim M. Crawford, Kason Leung, Anatoliy Nosovitskiy, Margaret A. Piemonte, Deval Shah, Dan Smith, Denis Tom **Support Technicians** Peter Bastide, Bruce Deodat, Charles Lin, Melanio Lopez, Mark Valentine **Inventory Control Coordinators** Bryan Hughes, Rob Graydon, William Pagan **Administrative Assistant** Jacqueline Paredes

PC MAGAZINE CD

Executive Editor Peter McKie **Art Director** Curtis M. Fields

PC MAGAZINE ON-LINE

Associate Editor Jenny Donelan **Technical Associate** Thomas W. Giebel **Staff Editor** Angela Hickman

Publisher Daniel Rosensweig

National Associate Publisher Nancy Newman **Associate Publisher, Marketing** Susan Delman **National Sales Director** Vickie Pinsky **Business Manager** Chris Eisenhardt **Director, Business Development** John Wisdom **Events Manager** Dawn Gudelis **Manager, Promotion and Public Relations** Lynne Hasluck **Research Manager** Elyse Berman

Senior Advertising Production Manager Lori Iaccino **Advertising Production Manager** Susan Conrad **Assistant Advertising Production Managers** Barbara Adams, Robert Joy **Editorial Production Manager** Pamela J. Berkowitz **Coordinator, Editorial Production** Louise Laberge

Advertising Office: One Park Ave., New York, NY 10016-5802; 800 33 MAG AD, 212-503-5100

Ziff-Davis Publishing Company
Chairman and CEO Eric Hippeau

Business Media Group
President Ronni Sonnenberg

Executive Vice President Claude P. Sheer **Vice Presidents** Joseph Gillespie (Magazine Networks), Bob Bader (Central Advertising Sales), Don Byrnes, Al DiGuido, Dan Farber, J. Sam Huey, Michael J. Miller, Paul Somerson, Jim Stafford **Executive Directors, Ziff-Davis Magazine Networks** Ellen Atkinson, Anna Zornosa **Managing Director** Lucy Wohltman (Ziff-Davis Preferred Customer Program) **Directors, Ziff-Davis Magazine Networks** Ann Fitzpatrick, Mark Glasner, Michael Kreiger, Jeff Lehman, Kelly Lowman, Melinda Maginn, Scott Murphy **Marketing Director, Ziff-Davis Magazine Networks** Michael Perkowski **Marketing Director, Ziff-Davis Magazine Networks/ZDPC** Jeff Bruce **Co-Directors, ZD Benchmark Operation** Bill Catchings, Mark L. Van Name **Director, ZD Labs** Bob Kane

Ziff-Davis Publishing Company

Presidents J. Scott Briggs (Consumer Media Group), Jeff Ballowe (Ziff-Davis Marketing and Development), Bob Brown (Computer Intelligence/InfoCorp), J.B. Holston III (International Media Group)

Senior Vice Presidents Baird Davis (Circulation), Rachel Greenfield **Vice Presidents** Tom McGrade (Assistant to the Chairman), T.L. Thompson (Business Manager), James F. Ramaley (Circulation Services), Elda Vale (Corporate Research and Analysis), Timothy J. Mitchell (Controller and Treasurer), J. Malcolm Morris (General Counsel and Secretary), Bruce W. Bourne (General Manager), Rayna Brown (Human Resources), Herbert Stern (Marketing and Development Group), Roger Herrmann (Production), Bill Machrone (Technology) **Chief Information Officer** Wellington Y. Chiu **Executive Directors**, Gertrud Borchardt (Licensing), Jim Manning (Marketing Services), Owen Weekley (Information Systems) **Production Director** Walter J. Terlecki **Director of Licensing** Jean Lamensdorf **Director of Public Relations** Gregory Jarboe

Subscription Inquiries, Address Changes

Subscription Services: For subscription service questions, address changes, or ordering information, call 800-289-0429 in the U.S., 303-665-8930 in Canada, or 303-604-7445 elsewhere. You can send faxes to 303-604-7455, or 303-604-0540 outside the U.S. Or write to *PC Magazine*, P.O. Box 54093, Boulder, CO 80322-4093.

Subscription Rate: The subscription rate is \$49.97 for a one-year subscription (22 issues). Canada and all other countries, please add \$36.00 for postage.

Back Issues: For back issues (subject to availability), \$8 per issue (\$9 outside the U.S.), send check or money order to Back Issues Dept., Ziff-Davis Publishing Company, P.O. Box 53131, Boulder, CO 80322-3131.

PC Magazine CD: *PC Magazine CD*, the interactive CD-ROM companion to *PC Magazine*, is available quarterly. To order (\$49.95 per year in the U.S., \$72 in Canada, \$99 elsewhere), please call 800-335-1195, or 303-665-8930 outside the U.S. and Canada. Or write to *PC Magazine CD*, P.O. Box 59494, Boulder, CO 80322-9494.

Customer Lists: We periodically make lists of our customers available to carefully screened mailers of quality goods and services. If you do not wish to receive such mailings, please write to us at *PC Magazine*, P.O. Box 54093, Boulder, CO 80322-4093.

How to Contact the Editors

We welcome letters. However, we cannot look up stories from past issues, recommend products, or diagnose problems with your PC by phone. Send your written questions, complaints, and compliments to *PC Magazine*, One Park Ave., New York, NY 10016-5802. Please include a daytime telephone number. Send electronic mail to MCI Mail box 157-9301, to CompuServe address 72241,104, to Internet address 157.9301@mcimail.com, or to *PC MagNet* (see below). *PC Magazine's* general number is 212-503-5255. The West Coast Operations number is 415-378-5500.

If you are dissatisfied with a product advertised in *PC Magazine* and cannot resolve the problem with the vendor, write (do not call) Amy Cimetta, Advertising Department, at the above address. Include copies of your correspondence with the vendor.

PC Magazine does not accept unsolicited manuscripts. We will pay \$50 for Solutions and Programming user tips and for Abort, Retry, Fail? submissions. If you submit artwork or clippings with Abort, Retry, Fail?, mark up a photocopy, not the original.

PC MagNet

PC Magazine operates *PC MagNet*, an on-line service of ZiffNet, hosted by CompuServe. To join, set your communications software for 7 data bits, even parity, 1 stop bit, and full duplex. To find the number nearest you, dial 800-346-3247. (In Canada, dial 800-635-6225, voice only.) At the Host Name prompt, enter PHONES. Follow the menus, note the number closest to you, then hang up and dial the number. At the HOST NAME prompt, enter CIS. At the USER ID prompt, enter 177000,5000. Enter PC*MAGNET at the PASSWORD prompt and PCMCIS95 at the ENTER AGREEMENT NUMBER prompt. When you join ZiffNet, you will be enrolled in both ZiffNet and CompuServe, for a charge of \$13.45 a month. The connect-time charge is \$4.80 an hour, billed by the minute. Areas free of connect charges for ZiffNet members are *PC Magazine Editors' Choice* awards, the ZiffNet Magazine Index, Buyers' Resources, Newsbytes, ZiffNet Highlights, and the current Utility (type GO ZNT-FREEUTIL). For ZiffNet member services, call 617-252-5566. You can also visit *PC Magazine* on the World-Wide Web at <http://www.ziff.com/~pcmag>.

If you are on the Internet, you can download the utility from our anonymous FTP server at <ftp.pcmag.ziff.com>. You can also receive the free utility on-disk by faxing to 617-374-4007.

Permissions, Reprints

Material in this publication may not be reproduced in any form without permission. If you want to quote from an article or use *PC Magazine's* logo in conjunction with an Editors' Choice designation, write Chantal Tucker or fax her at 212-503-5420; for information on reprints in quantities of 500 or more, write Carol Peters.

Editorial and Business Office: One Park Ave., New York, NY 10016-5802. Editorial: 212-503-5255; Advertising: 800 33 MAG AD, 212-503-5100.

The following are registered trademarks of Ziff-Davis Publishing Company: DOSMark, NetBench, PC, PC DIRECT, PC Labs, PC MAGAZINE, PC MAGAZINE AWARD FOR TECHNICAL EXCELLENCE, PC MAGAZINE EDITORS' CHOICE, PC MagNet, ServerBench, WinBench, Winstone, and ZD.

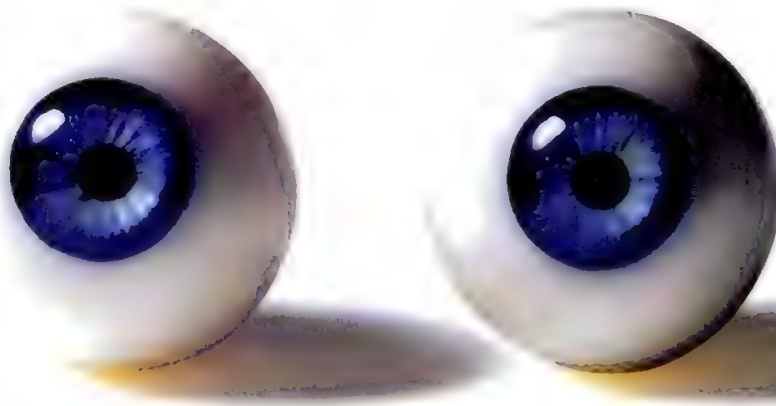
The following are trademarks of Ziff-Davis Publishing Company: Abort, Retry, Fail?, After Hours, BusinessCard, Corporate Developer, CPUmark, Extending Your Apps, Features Plus, First Looks, First Looks Plus, Lab Notes, New & Improved, OFF THE STACK, PC Bench, PC Magazine At Home, PC Magazine CD, PC Magazine Marketplace, PC Solutions, PC Tech, Pipeline, Power Programming, Quick Clips, Read Only, ScreenDemos, Tech Notes, Tutor, User-to-User, WinDraw, ZDigit, and ZiffNet.

Other trademarks and trade names used throughout the publication are the property of their respective owners.

Except where noted, all *PC Magazine* reviews are of currently available products.

Copyright (c) 1995 Ziff-Davis Publishing Company. All rights reserved. Reproduction in whole or in part without permission is prohibited.

SHOPPING FOR A 17" MONITOR? ENJOY THESE FABULOUS SAVINGS.



monitors — far surpassing the health and environmental criteria of MPRII and sparing your eyes the anguish of hours of staring into lesser systems.

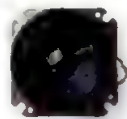
So if you are considering a new 17-inch monitor, you owe it to yourself to consider

MAXIMUM REFRESH RATE FOR EACH RESOLUTION						
RESOLUTION	640x480	800x600	1024x768	1280x1024	1600x1200	2048x1536
44.7"	85Hz	75Hz	75Hz	75Hz	75Hz	75Hz
44.7"	85Hz	75Hz	75Hz	75Hz	75Hz	75Hz

a Nokia. Never has the phrase "visionary technology" been truer. Or more important. Call 1.800.BY NOKIA for your nearest dealer.

"If you stare into only one 17-inch screen this year, let it be Nokia's..." said the editors of *Home Office Computing*. Excellent advice, if you want to rub your eyes in astonishment — not irritation.

(which *HOC* Editors examined,) you'll enjoy unparalleled clarity.** At their maximum refresh rates, either can render images of near photographic stability.



The longer you look, the

Even at first glance, the difference is clear.

Nokia makes speakers for German luxury cars, so adding them to monitors was easy

deeper your appreciation goes. Nokia

Whether it's the Nokia 447X professional caliber system (voted the Best Monitor of 1995*) or the multimedia 447L with built-in speakers

innovations like the exclusive MicroEmission™ option and the anti-glare coating make these the world's most user-sensitive 17-inch



NOKIA
MONITORS



*PC Magazine, 1/95 **When used with an appropriate graphics card. 17" CRT yields a diagonal picture size of 15.5". Manufactured and designed in Finland in an ISO 9001 approved environment. Size of CRT measured diagonally. Actual viewing size is slightly less. ©1995, Nokia Display Products, Inc. MultiGraph, ValueGraph, MicroEmission and FullScreen are trademarks of Nokia Display Products, Inc. E-Mat, bynokia@aol.com. Prices and specifications subject to change without notice. The Energy Star emblem does not represent EPA endorsement of any product or service. All other trademarks are the sole property of their respective companies.



Travan minicartridges require compatible drives. Preference and reliability ratings based on independent research.
Travan is a trademark of 3M. © 3M 1995

Introducing our new high-capacity, affordable storage solution: Travan technology. Use 3M Travan minicartridges to off-load little-used files. Archive old information. Transfer large documents. And back up critical data. The 400 megabyte (uncompressed) TR-1 minicartridge is only the beginning. As your needs change, Travan technology



*Travan drives available from
Aiwa, Conner, Exabyte,
HP Colorado, Imagem, Ritec,
Rexon and Teac*

keeps pace, continuously expanding, with capacities to 4 gigabytes in the near future. It's one more reason why more businesses protect important information on 3M brand data storage products than any other brand in the world. To find out more, call 1-800-888-1889, ext. 2300. Or send e-mail to datastorage@mmm.com.

Expand your vision with Travan Technology.

3M Reliability

CIRCLE 910 ON READER SERVICE CARD

A u g u s t 2 4 t h w i l l n o l o n
t h e w a f f l e i r o n w a s

ger be remembered as the day
officially patented.

you decide. the on-line Windows® 95 launch. starting august 24 ~ <http://www.microsoft.com>

© 1995 Microsoft Corporation. All rights reserved. Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation.



The Amazonian piranha uses razor-sharp teeth to rip out bloody chunks of your quivering flesh until you thrash and convulse in mind-numbing agony and plead for someone to kill you.

[Sort of like using someone else's network fax solution.]



Everyone knows that network faxing is an amazingly convenient way for people to fax right from their PCs. So there's no more schlepping to the fax machine. Everyone also knows it's agonizingly painful to implement. But now there's Delrina WinFax™ PRO for Networks 4.1. It does for network faxing what Delrina WinFax PRO did for PC faxing — finally make it easy. Installing it takes no time. It's simple to add users and modems. Sending a fax from any Windows application is as easy as printing a document. And since people share phone lines and modems, you save money. See your dealer or call us at 1-800-315-5845 for more information about WinFax PRO for Networks. And go ahead and jump right in to network faxing. The water's fine.



WinFax PRO for Networks is based on WinFax PRO the world's #1 fax software

Delrina WinFax Pro for Networks works with your existing hardware and software, including all popular e-mail packages. • It works with all popular networks, including Novell NetWare, Personal NetWare, LANtastic, Banyan Vines, Microsoft® LAN Manager and Microsoft® Windows™ for Workgroups. • No dedicated fax server is required. • It's compatible with more than 600 modems. • It costs less than you think. • And it makes the ideal choice for workgroups of up to 50 people.

DELTRINA 

Delrina and WinFax are trademarks of Delrina. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. All other product names are trademarks of their respective owners. ©1998 Delrina. All rights reserved.

CIRCLE 213 ON READER SERVICE CARD

Letters

OUT-OF-BOX OR OUT-OF-MIND?

Jim Seymour's column "Reasons to Be DOOBEous" (April 11, 1995) is right on target. The inordinately high chance of receiving "junk in the box" instead of a product that works out of the box, along with the computer industry's general lack of regard for its customers, has left consumers bewildered. Any other industry trying to get away with this kind of behavior would be run out of town. More pressure is necessary to make PC and software vendors understand that they must develop a healthy respect for the customers who keep them in business. It's time to take a firm stand.

RAYMOND S. NIEDOWSKI,
Marshfield, Massachusetts

A concerted effort is needed to establish hardware and software standards and to hold vendors accountable for their products. Plug-and-play may exist on the Mac side of the equation, but not among PCs. Changes must be made before the PC market crumbles from its lack of compatibility.

TOM BEAUSOLEIL, Bozeman, Montana

I spent a good part of this past Christmas day helping friends with their new computers and software. All of those phone calls would have been unnecessary if more care had been paid to specifying compatibility on the box.

MARK HEPBURN, Houma, Louisiana

THE WIDENING WORLD OF THE WEB

Your special report "The World-Wide Web: A Guided Tour of 100 Hot Sites" (First Looks, April 11, 1995) was very impressive. I thought I was well-versed in Web sites, but your article showed me a thing or two. Every site listed is well worth looking at. How about doing a report on 100 hot FTP sites next?

NICHOLAS DUFFY, *via the Internet*

Thank you for providing the Web address for the virtual frog. As a proud holder of a B.S. in zoology, I sure wish there'd been some virtual dissection way back when.

CATHY GANSSLE, *via PC MagNet*

Thanks for the fabulous article on Web sites. It's by far the most helpful article on browsing the Web that I've ever read, and as such it's a wonderful aid to surfing the Internet.

GORDON ROSS, *via the Internet*

What a superb report on the Web. Not only did you provide a great collection of excellent Web sites, but you also made the list available in Hypertext Markup Language on your home page. This is the sort of thing that makes the Web and PC Magazine great.

DAVE MEYER, *via PC MagNet*



*The industry's lack of regard
for its customers has left
consumers bewildered.*

Congratulations! Your Web home page is not only full of useful information and links, it's also one of the best organized and designed pages I've seen in a while.

MALCOLM J. PANTHAKI, *via PC MagNet*

WHO FIRED THE FIRST FATEFUL SHOT?

Michael J. Miller's column "Who Shot OS/2?" (April 11, 1995) observes the obvious: Windows gets more coverage because there's more written for Windows than for OS/2. But if this is how an operating system is to be judged, it is a millstone around the neck of any operating system that's compatible with DOS and Windows apps. As long as DOS/Windows drives the marketplace, smaller developers, who lack the resources to support multiple versions of applications, will continue to write software for the market leader. An operating system's success should be judged on its overall performance and support of all existing applications, not on how many exclusive applications are available.

DAVID B. SARGE, *via the Internet*

OS/2 advocates don't disagree with your coverage of Windows. What we're tired of is the countless stories on vaporware when IBM is already shipping OS/2 Warp. You wish for OS/2 users to be fair; all we ask is the same.

DEWAYNE EPLEY, *via the Internet*

TAKING THE INSIDE TRACK

John C. Dvorak rightly blames the proliferation of bloated code on the explosion of features (Inside Track, April 11, 1995). But new features are not necessarily bad; the more a

software package can do, the greater its potential worth to the user. The problem is not that applications provide more features, but rather that they provide features you'll never use.

DANIEL MOCSNY, *via the Internet*

Dvorak praises legislation pending in Virginia that would make software with built-in disabling code illegal. I disagree. Sure, it's annoying to deal with software that disables itself after a given amount of time, but it's also a hassle to renew an auto license every few years. The disablement code means that the license has an expiration date, just like your auto license.

JIM MILLARD, Kansas City, Missouri

As Chairman of the Fairfax County (Virginia) Chamber of Commerce, I read Dvorak's commentary with great interest. There's a distinct need for software-disablement code; it's the only safeguard some companies have to protect their intellectual property. And this issue should remain a contractual one between the owner and user of the software, as opposed to becoming part of the criminal code of Virginia or any other state.

JOEL M. BIRKEN, Vienna, Virginia

DIGITAL SHOTS

The digital video story "Shot by Shot" (April 11, 1995) was very enjoyable and helpful; you did a great job. Other pieces I've read on this subject were not nearly as thorough or technical.

MARK MENKHUS, *via the Internet*

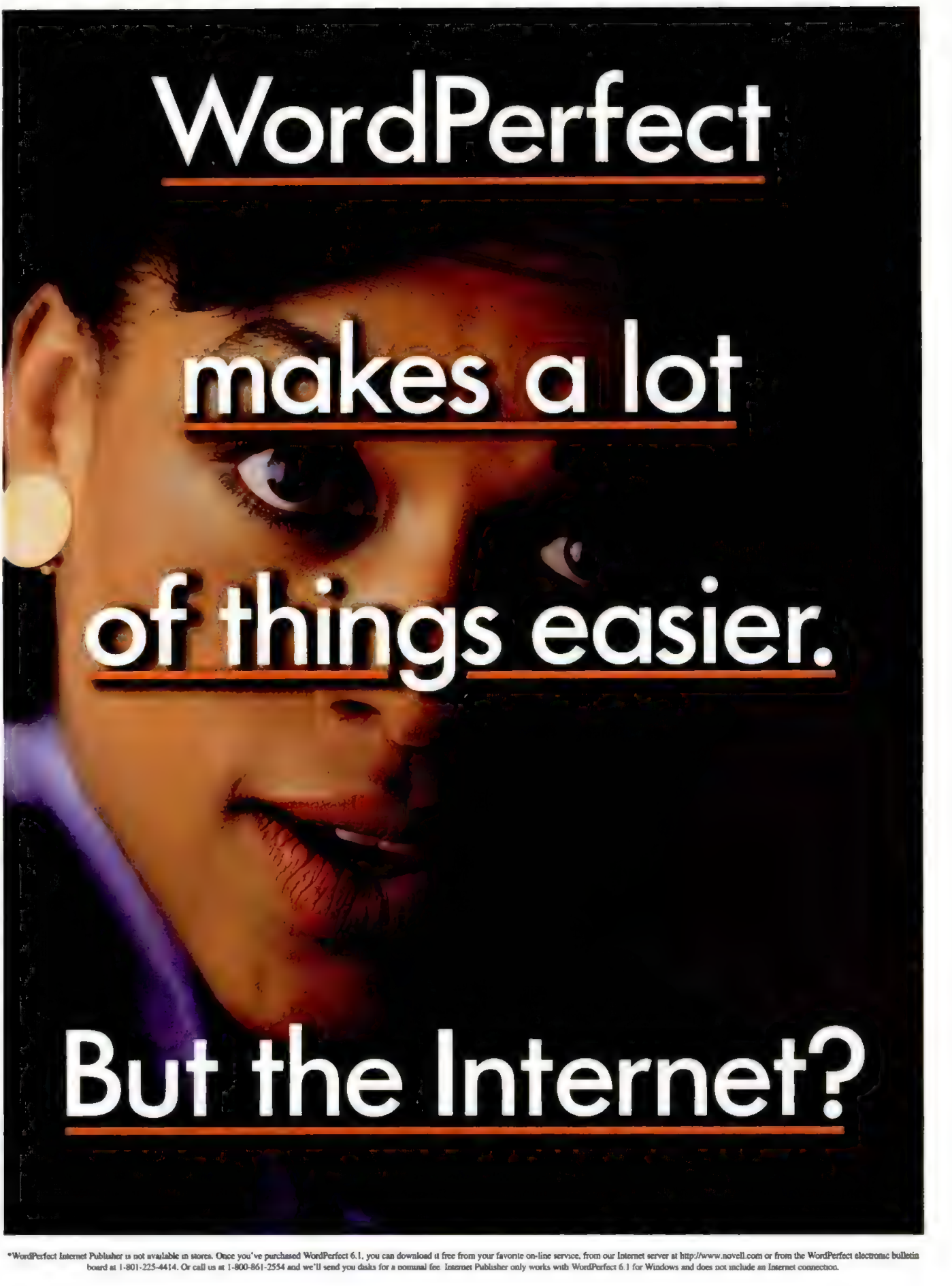
It's interesting that of the 11 video capture boards you reviewed, 8 had incompatibility problems ranging from restrictions on VGA display modes to an inability to work with your primary test-bed machine. And your Editors' Choice for video editing crashed on a machine with network drivers installed. This is what you mean by "level the Mac-versus-Windows playing field"?

LAWRENCE D'OLIVEIRO, *via the Internet*

THOSE GATEWAY BLUES

Congratulations to Bill Howard for finally addressing the anomaly of Gateway 2000's service and reliability ("The Gateway Phenomenon," March 28, 1995). My experience with Gateway was radically different from your glowing reports of the past. Howard makes excuses for Gateway. As a consumer, I couldn't care less why I got a dud computer system or why I repeatedly could not get through to technical "support." All I know is that these problems don't arise with other companies rated lower on your service and reliability reports.

TIM BANDY, Belleville, Michigan



WordPerfect

makes a lot
of things easier.

But the Internet?

*WordPerfect Internet Publisher is not available in stores. Once you've purchased WordPerfect 6.1, you can download it free from your favorite on-line service, from our Internet server at <http://www.novell.com> or from the WordPerfect electronic bulletin board at 1-801-225-4414. Or call us at 1-800-861-2554 and we'll send you disks for a nominal fee. Internet Publisher only works with WordPerfect 6.1 for Windows and does not include an Internet connection.

New WordPerfect® 6.1 for Windows†

The upgrade that automates everything— including the Internet.

WITH OUR FREE WORDPERFECT

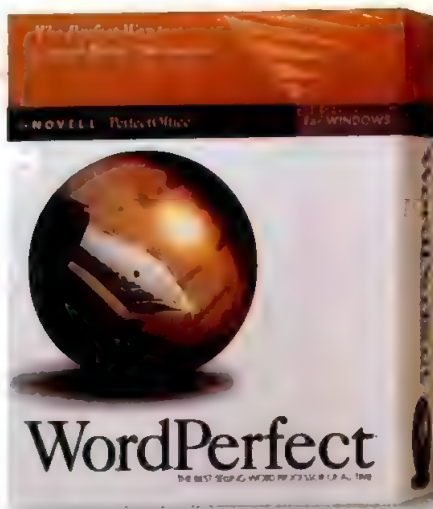
INTERNET PUBLISHER ADD-IN,

YOU CAN BROWSE, VIEW AND

EVEN CREATE **WORLD WIDE WEB**

DOCUMENTS RIGHT FROM

WORDPERFECT 6.1.



For years, WordPerfect has made things automatic—formatting, grammar checking, that sort of thing. But now we're making something else just as easy—the Internet.

Here's how it works. When you upgrade to new version 6.1, you can get our free add-in, WordPerfect Internet Publisher.* It lets you browse the World Wide Web with Netscape

Navigator†, which you can access from the WordPerfect toolbar. Or view Envoy™ files on the Internet with the included Envoy viewer.

Internet Publisher lets you create your own Web documents right from WordPerfect. It automatically converts them to HTML format (the language of the World Wide Web), so you don't have to learn any complex programming. It's just as easy as creating any other WordPerfect document.

And WordPerfect makes finding all those files you've downloaded from the 'Net just as automatic. Our exclusive QuickFinder™ file indexer quickly searches all your documents by content and descriptive name.

We even automate working with other programs. WordPerfect is tightly integrated with Quattro® Pro and other products in our new PerfectOffice™ suite of applications.

As you can tell, we've automated a lot of things in new WordPerfect 6.1. Even things you wouldn't expect. Like the Internet. So upgrade today.



SEE BELOW
FOR DETAILS*



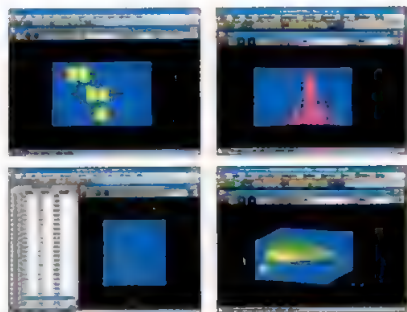
WordPerfect®

NOVELL

THE PERFECT PLACE TO WORK™

READ THIS IF YOU'RE CRAZY ABOUT STATISTICS

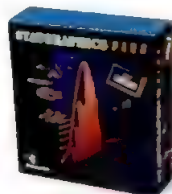
STATGRAPHICS Plus for Windows™ makes complicated statistics easy. It has the smartest screens you've ever seen, with menus that guide you through even the most complex analyses. Whether or not you ever took a statistics course, you'll find yourself mastering everything from regression analysis to ANOVA.



Fact is, you'll find everything you want in a statistics package in **STATGRAPHICS Plus** for Windows.

- Truly interactive graphics
- StatFolio, the revolutionary new way to save and reuse your analyses
- Dynamic Data Exchange
- 32-bit design
- Specialized modules for Quality Control, Experimental Design, Time-Series Analysis, Advanced Multivariate Methods

If you're ready for statistical graphics software that thinks the way you do, call us for the details about **STATGRAPHICS Plus**. You'll be crazy not to.



STATGRAPHICS® Plus

800-592-0050 ext. 200

Outside the U.S., 301-984-5412

STATGRAPHICS is a registered trademark of Statistical Graphics Corporation.
©Manugistics, Inc. 1995.

CIRCLE 385 ON READER SERVICE CARD

Letters

I was apprehensive about calling Gateway's technical support, but I was in for a pleasant surprise. The wait for a connection was less than 5 minutes, and the technician was courteous and extremely competent, patiently talking me through an extensive diagnostic and successful solution of the problem.

STEVEN W. MCGANKA,
Buffalo, New York

The love-hate relationship with Gateway is not really the paradox it seems. Gateway sells pretty good hardware at darn good prices. So most of the time, it's a great deal. But should something go wrong, dealing with Gateway can be a bother. Still, they've done right by me every time.

STEPHEN MCCALLISTER, via the Internet

When I encountered problems after a power surge, I called Gateway. By the next day, a technician called back to say he was sending me a whole new motherboard. Total time elapsed until I was up and running again: five days. Cash cost to me: zero. I call that exemplary service that goes beyond the normal call of duty.

THOMAS BRUNKOSKI,
Westport, Connecticut

As the owner of a terrific Gateway unit, I can identify with some of the issues Howard raised. But to compare Gateway to a St. Bernard puppy that "means well" is not entirely accurate. I agree that a lot of Gateway's problems are related to growth. But its customer service can be absolutely terrible, and there's no excuse for treating customers as

CORRECTIONS AND AMPLIFICATIONS

In our roundup of multifunction printers "Swiss Army Printers" (June 13, 1995), the correct toll number for the Editors' Choice award-winning Brother Multi-Function Center 4500 ML is 908-356-8880 ext. 4504.

The fact file for our First Looks review of NEC Technologies' MultiSpin 6Xe CD-ROM drive ("Six-Speed CD-ROMs: For Heavy Data-Lifting Chores," June 27, 1995) was inadvertently omitted. The estimated street price of the product is \$599. NEC may be reached at 800-632-4636 or 708-860-9500.

The correct toll-free phone number for Iomega Corp., maker of the Zip drive (First Looks, "Is Iomega's Zip Tomorrow's Floppy Disk Drive?" June 27, 1995), is 800-697-8833.

In Robin Raskin's Pipeline column "Microsoft, Keep Out!" (June 13, 1995), it was incorrectly reported that Microsoft's on-line registration process asks for copies of your CONFIG.SYS and AUTOEXEC.BAT files. The Windows Survey Disk and Bug Reports ask for that information. The on-line registration process asks for a complete list of your hardware components and then scans your hard disk to determine which software applications you're running. You are then given the option of whether to transmit this information to Microsoft.

Also, in the Pipeline column "Bugs in Your Bonnets" (May 16, 1995), although it was correctly stated that Intuit pays IRS penalties derived from bugs in its products, we neglected to mention that Intuit has extended the original penalty-payment guarantee to include any interest charges.

they do. A well-meaning puppy? No, it's more like an ill-mannered one.

JIM FARISS, via PC MagNet

Thanks to my negative experience with Gateway, my trust in computer companies has diminished considerably. I once thought this company was the only way to go; now I feel it's the only one to go away from.

CHERYL STEVENS, Boise, Idaho

UPPING THE ANTE

PC Magazine's current service and reliability results ("Service & Reliability: Are You Getting What You Need?" July, 1995) do not reflect Zenith Data Systems' recent enhancements to customer service and support. Since the time that your survey was conducted, we have implemented such improvements as 24-hour, 7-day toll-free technical support; next-business-day turnaround repair service during the first year (for certain products); and extended on-site warranties.

CLIFF JENKS,
EXECUTIVE VICE PRESIDENT,
ZENITH DATA SYSTEMS
Buffalo Grove, Illinois

HOW TO CONTACT US

We welcome your comments and suggestions. Please send Letters to the Editor via

THE INTERNET 157.9301@mcimail.com

COMPUSERVE 72241,104, or to individual editors as listed on ZiffNet (type GO PCMSTAFF)

FAX 212-503-5799

MAIL Letters, PC Magazine, One Park Ave., New York, NY 10016-5802

All letters become the property of PC Magazine and are subject to editing.

We regret that we cannot answer letters individually. To send submissions for PC Solutions, please see the sidebar "How to Contact Us" on the second page of that column.



**THE MOST
POWERFUL MEMORY**

**MEETS THE
MOST POWERFUL
MULTIMEDIA
ACCELERATOR**



\$339
Estimated
Street Price

Introducing MGA Millennium

Looking for the most powerful performance from a graphics accelerator? Matrox's new 64-bit Window RAM graphics accelerator outperforms today's DRAM, VRAM and even 128-bit graphics solutions with over 60 million Winmarks of super sonic speed.

Combining superior Window RAM memory with MGA's new integrated 64-bit chip design, MGA Millennium delivers powerful acceleration for the world's fastest Windows and DOS performance.

And because it integrates hardware accelerated true color, digital video and 3D into a single chip design, MGA Millennium also gives you the most comprehensive, all-in-one multimedia acceleration on the market.

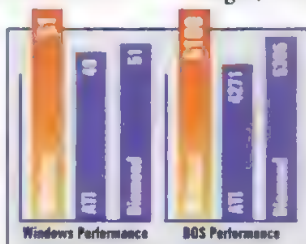
You can work in resolutions up to 1600 x 1200 in accelerated 24-bit color mode with up to 8 MB of Window RAM. Playback smooth digital video. And render dazzling 3D graphics in real-time.

Its advanced video playback acceleration does more than just display your MPEG and AVI video clips. It transforms your PC into a professional multimedia workstation. By accelerating video upscaling and color space conversion, MGA Millennium gives you full screen playback at 30 frames per second for high quality video.

Its powerful 3D graphics engine renders your 3D games, CAD designs, business presentations and animations in photo-realistic colors and textures. You can then *interactively manipulate* your 3D graphics in full motion, full screen view.

And finally, using a 32-bit VGA core, MGA Millennium delivers lightning fast DOS performance for your favorite VGA text and games.

For the most powerful, all-in-one multimedia accelerator, look to MGA Millennium. Starting at \$339*.



Matrox's MGA Millennium outperforms ATI's Graphics Pro Turbo and Diamond's Stealth 64 in both Windows and DOS

- OVER 20 PRODUCTIVITY FEATURES FOR WINDOWS AND CAD
- UP TO 1600 x 1200 IN 16.7M, 65K AND 256 COLORS

- 220 MHz DAC FOR 85 HZ REFRESH AT 1600 x 1200
- 32-BIT VGA CORE FOR SUPERIOR DOS PERFORMANCE
- FULL SCREEN, FULL MOTION MPEG AND AVI PLAYBACK
- HARDWARE ACCELERATED 3D FOR GAMES, CAD, PRESENTATIONS AND MORE!
- PCI BASE VERSIONS AVAILABLE IN 2 MB OR 4 MB OF WINDOW RAM
- UPGRADEABLE TO 4 MB OR 8 MB OF WINDOW RAM
- NEW 3 YEAR WARRANTY

FOR MORE INFORMATION CALL: 1-800-583-3393

*Estimated street/estimated selling price for the 2 MB version. Windows and DOS tests conducted by Matrox Graphics Inc. using Ziff Davis' WinBench 4.0 and PC Bench 9.0 on an Intel Pentium P100 system (256 cache, 8 MB EDO RAM, Windows for Workgroups 3.11) at 1024 x 768 in 256 colors, 72 Hz, large fonts. MGA Millennium, Stealth 64 and Graphics Pro Turbo were configured with 2 MB of memory for the PCI bus using driver releases 1.00.20, 1.3 and 1.3 respectively.

Matrox Graphics Inc.
1025 St. Regis Blvd. Dorval, QC H9P 2T4 Canada
Tel: (514) 969-6320 Fax: (514) 969-6363
In Quebec, call: (514) 969-6330

M A T R O X
MGA
POWER GRAPHICS



matrox

CIRCLE 124 ON READER SERVICE CARD

No Wires. No Limits. Testimonial #1:

"Battling backlogs of messages after all day

"With Envoy I don't get 'stuck' in meetings. I send and receive messages, right at the conference table. No post-meeting backlogs. Envoy levels out my workload. I love it!"

Introducing Envoy® and Marco®: the first family of Wireless Communicators which offer fully integrated, two-way wireless connectivity to almost any E-mail address worldwide. Messaging is "exquisitely easy" (InfoWorld), "seamless and reliable" (MacWeek). A message often costs less than a postage stamp — whether you're sending it to 1 person or 100.

"Envoy thinks like I do. Sounds weird, but while I'm physically at one meeting, I'm part of three or four others going on in my Envoy!
I'm E-mailing, I'm faxing, I'm wireless, man!"

No matter how positive the reviews, or how many users swear by their Envoy or Marco wireless communicators, there's only one way to find out if they're right for you: try one. Call us. We'll point you to a local dealer and send you an information kit. And if you purchase an Envoy or Marco within 90 days of calling us,

we'll send you a free leather carrying case (a \$79 value). For more information on these products,

call 1-800-894-7353, visit us on the World Wide

Web at <http://www.mot.com/wdg/or>

E-mail us at wireless@mot.com on

the Internet. And remember. No wires. No limits.



The Envoy on the General Magic Magic Cap™ platform is packed with time-saving features accessible with the tap of an icon—no manual required. Send text and handwritten messages via radio, phone/fax or infrared. Let 'smart agents' automatically reschedule meetings, update addresses, etc., while you get on with business.

envoy
WIRELESS COMMUNICATOR

Using the Newton platform, Marco emphasizes wireless connectivity to network applications like desktop E-mail and corporate databases. Marco finally brings the Newton platform into its own (with) the right mix of built-in communications and operating software enhancements." (MacWeek).

marco
WIRELESS COMMUNICATOR



ARDIS PersonalMessaging™

Two-way peer-to-peer messaging where message delivery is guaranteed and rates for typical messages are far less than nationwide one-way wireless and, unlike cellular, there are no roaming charges. The ARDIS two-way wireless network covers over 90% of U.S. business locations with deep in-building, in-vehicle and on-street coverage.



MOTOROLA

1-800

"Load Leveling Your Day"

faxes, E-mail and bored meetings drove me wireless!

Mike Backes
Hollywood Screenwriter
Cofounder, Rocket Science
(Yes, this really is Mr. Backes)

PC Magazine [4.75.95]

"Envoy and Marco are actually delivering on the promise of ubiquitous connectivity and smart communications.... They go beyond anything else on the market.... the first PDAs worth owning."

PC Week [1.30.95]

"Envoy and Marco.... are on the leading edge of continuous connectivity and are real indicators of where the PDA market is heading."

Mobile Office [4.95]

"The Envoy is a terrific piece of engineering, and the wireless link puts it miles ahead of anything else in its class."

Network World [5.13.95]

"With its integrated wireless capability, Marco clearly outshines the rest."

-8-wireless



May 30, 1995
LANtastic 6.0
Network
Operating System

Small-Business Networks

1st
PLACE

LANtastic

3rd
PLACE

Microsoft
Microsoft Windows[®] for Workgroups

NO
PLACE

 **NOVELL**
Novell NetWare[®]

Microsoft & Novell really put us in our place this time.

In a recent article, the editors of *PC Magazine* named us the best small-business network. Which is no surprise to us. Because 3.2 million small-business PCs already network with LANtastic. And we're still the best choice around. In fact, of the three products reviewed in the category, Microsoft Windows for Workgroups placed third. Novell® NetWare wasn't even included. To see for yourself, call 1-800-809-1242. We'll send you the article, along with LANtastic product information. Or, find us at <http://www.artisoft.com> on the Web. We'll tell you all about our place in small-business networking—first. **LANtastic®** Powerfully simple networking.

Tempe, AZ © 1995 ARTISOFT, INC. All rights reserved. Artisoft and LANtastic are registered trademarks and Powerfully simple networking is a trademark of Artisoft, Inc. PC Magazine Editor's Choice Award is a trademark of PC Magazine. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. Novell and NetWare are registered trademarks of Novell, Inc. Other company names, brand names and product names are the property and/or trademarks of their respective companies.

CIRCLE 254 ON READER SERVICE CARD

COREL
CD HOME

5 GREAT BOARD GAMES

- ▶ CHESS
- ▶ CHECKERS
- ▶ REVERSI
- ▶ SNAKES AND LADDERS
- ▶ PUZZLES

AGES 4 TO 10

ATTENTION PARENTS!

Your child will learn:

- Simple mathematic skills (pre-math)
- Hand-eye coordination
- Number recognition
- Logical and strategic thinking skills
- An important social skill to enjoy for a lifetime

Let the computer teach your child to play board games.

For Windows[®]
and Macintosh[®]

Wild BOARD Games™

The fun way to learn popular board games!

Learning chess, checkers, reversi, snakes and ladders and creating puzzles has never been this much fun! Play any of these popular board games in a variety of fun-filled settings—the attic, the basement, the backyard and the kitchen—against a cast of zany opponents. In addition, each room contains exciting activities and fun hot spot animations that will provide your child with endless hours of fun and exploration.

TigerDirect
1-800-CD-TIGER
1-800-238-4437

Please mention code BVJ

\$34.90

US\$ plus applicable taxes

CIRCLE 042 ON READER SERVICE CARD



COREL
Call now for instant information!
1-813-728-0826 ext. 3080
Document #1088

Trends

TRENDS & TECHNOLOGY SHAPING THE PERSONAL COMPUTER MARKET

Your Dream PC: 2005

Photonics promises fast, light computers.

Talk about your dream PC. Ten years from now, a mainstream computer may run at a clock speed of 10 gigahertz, pack a gigabyte of memory and 100 gigabytes of storage, weigh four ounces, run for weeks at a time on battery power, and display a crisp resolution of

10,000 by 10,000 pixels.

Sound far-fetched? Not to Alastair McAulay, professor of electrical engineering and computer science at Lehigh University, where he's been coaxing photons—uncharged particles of light that are superior to electrons for moving data at high speed—to serve multiple uses in PCs. He anticipates that around 2005, a PC will be on the market that relies as much on photonics as electronics.

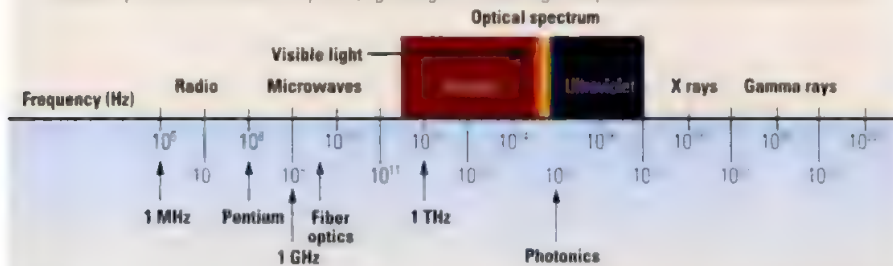
"Performance goals will be difficult to meet without using photonics for a number of sub-

ond, limited only by the frequency of the light.

So taking a hint from the communications industry, which has seen major performance improvements in the move from copper wire to fiber optics, researchers are leveraging photonics for use in computer buses, storage devices, and interfaces to future optical networks. Recently, the Lehigh lab produced high-speed optical memory that could give PC designers new alternatives for cache, main memory, and storage. "As far as we can tell, it stores data indefinitely, and there's no limit to

Moving up the Electromagnetic Spectrum

Photonics promises to enable low-power, lightweight PCs with high computation and communication rates



systems," claims McAulay. Photons are well-suited to fast computing since they can provide a high data-rate information channel that's needed for fast access from CPU to memory. While the speed of electronic communication is limited by "wire cable loss" (at most, one bit can be carried per cycle by switching a cycle on or off), photonic communication over optical fiber has virtually no loss per meter, providing a potential capacity of 500 terabytes per sec-

the number of times it can be read/write cycled," says McAulay.

Developing a photonics-based processor is a bigger challenge. In fact, it's already been tried. In 1990, the optical computing research department at AT&T Bell Labs demonstrated the world's first optical digital processor, but that work moved immediately into photonics switching, the kind of computing needed in the phone network.—Carol Levin

CD-Revolution

SIX-SPEED CD-ROM DRIVES ARE now hitting the market in volume, but trends in the CD-ROM industry are leading some experts to speculate that 6X won't be around for very long.

The new drives boast data-transfer rates close to a megabyte per second and faster access times, but the performance boost over quad-speed may not be enough to enable a new class of applications. "I think 6X may be to 8X what 3X was to quad-speed," says Ted Pine, chairman of market research firm InfoTech Inc., referring to the paucity of 3X models that were introduced before quad-speed drives hit the market. "It's only an incremental step. We should be seeing 8X drives in the near future."

Some vendors, most notably Toshiba, are waiting to see if there's a long-lasting market at 6X. "While we have ongoing developments for both 6X and 8X, our focus is on penetrating the quad-speed market," says Jerry Higgins, vice president of marketing, CD-ROM products, at Toshiba.

The direction of the market could change next year, when new high-density CD-ROM formats become available. Two major consortia are now pushing competing technologies. Sony and Philips Electronics have put their weight behind the Multimedia CD format, which would enable compact disks to hold up to 3.7 gigabytes of data. Meanwhile, Toshiba is leading the charge for a 5GB standard, the Super Compact Disk.

"We can expect to see a fragmentation of the market," explains Jerry Harris, vice president of strategic planning at CD-ROM drive maker Lion Optics. "Early adopters will move to high-density technology right away. The rest of us will stick with standard CD-ROM until high-density becomes affordable." Harris also expects to see recordable CD drives (CD-R) from a half-dozen vendors by the end of the year.

So what might we see in CD-ROM technology a few years down the road? Fully rewritable CD-R at an attractive price, for one thing, and high-density CD-ROMs holding up to 10GB of data for another. Six-speed drives may be only a faint memory by then.—Asa Somers

Pipeline By Robin Raskin

Pity the Poor Developer

Every once in a while I check in with my developer friends. This week's topic was the confusion caused by Intel's NSP and Microsoft's DirectDraw initiatives.

"It used to be that you'd call Intel or Microsoft, ask for some information on a spec, and they'd say they didn't have anything to send you," says Steve Edelson of Shadow Systems. Now, he says, they send you 18 gigabytes worth of CDs, white papers, and technical specs anytime you ask for anything. Oliver Jones of Vivo Software calls the deluge "markeengineering"—definitely a new buzzword.

Seriously, there are some terrific things about Intel's NSP (Native Signal Processing) initiative. (An initiative in this context is a set of meandering, loosely defined goals.) Intel's overarching goal is to standardize on an advanced hardware platform with associated APIs and a real-time software layer, so that applications developers can finally make calls to hardware components such as fax and telephony and know that the calls are supported adequately. It's a noble mission.

Intel figures it can also take advantage of the time your processor is sitting around idle by using the processor to handle fax, sound, and video compression. (Microsoft, by the way, is calling dibs on CPU idle times for some nifty new task agents in the PowerPlus Pak for Windows 95.) Intel's notion of using a \$275 to \$900 Pentium to do something that the DSP vendors swear they can do with a \$20 chip is interesting.

DSP vendors are worried that if Intel uses the processor to handle basic multimedia, then the only people who will buy DSPs are the lunatic fringe who never have enough horsepower. Truly,

though, DSPs can offer tremendous differentiation above and beyond NSP performance. The big problem with DSPs is that, for the most part, they're incompatible with each other.

At least Intel seems committed to sticking with the name NSP. Microsoft began touting WinG as the answer for developers looking to write better games under Windows 3.1. WinG grew into a loose confederation of APIs. At the same time, DCI (Display Control Interface) began taking shape; this enabled WinG and Video for Windows to access video hardware.

As of April, the operative word for this kitchen sink of APIs, which Microsoft now describes as a component of its Games SDK, became known as DirectDraw. DirectDraw manages video memory in order to let you do really cool things with graphics and improve digital video playback. A new and improved replacement for DCI, DirectDraw more easily parallels Apple's elegantly simple QuickDraw 3D.

It's a moving target. WinG developers shifted gears to move to DCI. Now they tell me that DirectDraw is compatible with some, but not all, of DCI. One vendor estimates that 5,000,000 DCI-enabled video boards will have shipped by August. He says it's likely that video playback performance with these boards will degrade under Windows 95 until they get DirectDraw drivers. On the software side, many developers have been through at least three generations of Microsoft game APIs and haven't even released a title yet.

Developers spend a lot of time reading before they can develop anything. Hardware developers moan that Microsoft barely acknowledges hardware in DirectDraw documents. Software developers tell me that Intel materials are written in some sort of strange "circuit design" language. I know things will sort themselves out, but pity the poor developers. They need a crystal ball, a good set of reading glasses, and a lot of initiative of their own to make it through to the next generation of code.

Robin Raskin is the editor of PC Magazine.

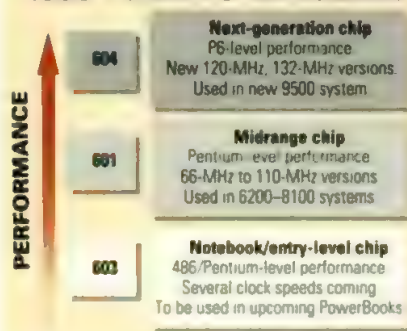
Apple's Day in the Sun?

AS PROOF OF APPLE'S MOVE TO open standards for its Macintosh line, the company will release several new lines of PCI systems based on the PowerPC 604 processor and new lines of PowerPC-based PowerBooks this summer. Says David Limp, Power Macintosh product line manager at Apple, "People are going to see that we're not closed-minded to standards."

First off the production line will be a new high-end entrant in the PowerMac line: the Power Macintosh 9500 system. Designed to upstage the company's current 8100 system line, the 9500 features the new PowerPC 604 chip running at either 120 MHz or 132 MHz. The 604 chip is targeted as a direct competitor to Intel's upcoming P6. The 9500 nearly doubles the performance of an 8100 system.

Starting at \$4,699, the 9500 series is priced evenly with the 8100 series despite a

1995 PowerPC Directions



Source: Apple Computer Inc.

substantial performance boost. According to Apple's Limp, lower prices are a direct result of Apple's new policies toward industry standards.

In particular, Limp points to the fact that

Apple is taking a serious look at the Universal Serial Bus (USB), and has standardized its systems on the PCI bus. The PCI bus opens systems and graphics subsystems up to benefit from economies of scale that previously benefitted only the PC. "Now that PCI is on the chip set, we can work with cheaper, DOS-compatible graphics cards, which along with Fast Ethernet and Fast/Wide SCSI have plummeted in price."

Though they're a drag on performance, a rapidly growing percentage of Apple systems feature new DOS/Windows-compatibility options, says Limp. Apple is also making several models with a 486 CPU. And Apple and IBM have finally agreed on a common hardware reference platform for PowerPC-based systems capable of running the Mac OS and PC-based operating systems.

Apple's PowerPC push won't go unchallenged. Intel's P6 has momentum, and now Apple faces competition from Mac clones. See First Looks for our evaluation of the Power Computing 100.—*Sebastian Rupley*

The New Net

TOM LIPSCOMB, PRESIDENT OF NEW York-based InfoSafe, says that by his company's tally, March of this year marked a major milestone for the Internet: "The number of sites with .com extensions officially surpassed the number of sites with .edu extensions." As the Internet is transformed

from a government-run educational and scientific ivory tower into a commercial entity, business is

booming. The boom is also fueling new, fierce price competition among commercial Internet connection and service providers who supply high-bandwidth access.

After gradually pulling out of financial and regulatory Internet involvement, the National Science Foundation recently pulled the plug on NSFNet for good. Universities and other institutions dependent on NSFNet have been sent to commercial service providers such as AT&T Network Services, MCI, and Sprintlink. The commercial providers—and a growing crop of hypercompetitive resellers—now function as the czars of high-bandwidth Internet connections.

According to Glenn Fleishman, a principal of Seattle's Point of Presence Web site developers, the move toward commercial providers and their network of resellers has so far had a beneficial impact, similar to



the impact deregulation had on regional Bell telephone companies. "Not long ago, the going cost for getting a T1 connection in through a large Internet-access provider was \$3,000 to \$4,000 a month," says Fleishman. Fleishman's current provider is Interconnected Associates, a small Seattle-area reseller for Sprintlink. "We're now paying only \$1,650 a month for our T1 connection, and it's all because companies are becoming aggressive about lowering rates," he adds.

Lowball reselling isn't the only source of new price competition. There are also new providers of high-bandwidth NAPs (Network Access Points) to facilitate the resellers. Chicago's Net99 has set up a NAP, and there are future NAPs planned for Denver, Seattle, Dallas, and several other cities. As NAP providers proliferate, price-competitive resellers have more choices. Fleishman points out that his connection provider has already begun an

arrangement between Sprintlink and Net99. Lower prices should follow.



Sprint.

There is some fear that loss of the NSF's long-standing authority over the Net may be damaging. Some had even envisioned widespread network failures when NSFNet officially shut down, but there were apparently only a few minor technical problems. According to Fleishman, "part of the point of the NSF's gradual disinvolvement was to guarantee its

influence over how the commercial providers function." Several commercial access providers, including AT&T Network Services and Sprintlink, are now developing large-scale customer support solutions—a sure sign that the Net's plumbing is big business.

For more information on the transition from NSFNet to commercial solutions, see <http://www.ra.net/routing.arbiter/NSFNET/NSF.transition.html>.—Sebastian Rupley

I Know It's Out There Somewhere. . . .

TAKE SIX COMPUTER JOCKS FROM Stanford University and give them a big problem to solve: turn the World-Wide Web's tangled mass of information into an easily navigable place. Their solution: Architext Software, a company that the graduates, all under 25, formed to develop their search-and-retrieval technology.

Backed by high-tech venture capital firms Kleiner Perkins Caufield & Byers and Institutional Venture Partners, Architext has built a concept-based search engine for Web servers that can identify relevant documents that may not contain your keyword.

tilling the Web's 40,000 (and growing) sites with Point Survey, a Zagat-like guide to the Web to which a staff of ten writers contribute reviews and ratings of 1,000 sites a month.

If you want your information completely unedited, there's the Open Text Web Index from Open Text Corp., which has 12 web crawlers working in parallel 24 hours a day, indexing every word on the Web. They've indexed a billion words so far. The service is free, offered as an incentive to license the company's Latitude search engine to run searches on your own internal networks.

Another approach to distilling informa-

Web Retrievers

Product or service	Developer	Description	Home page	Phone
Architext	Architext Software	Web server software that offers concept-based searches	http://www.atext.com	415-934-3611
InfoSeek Search	InfoSeek	Subscription service that searches Web pages, newsgroups, magazines, newswires, and other databases	http://www.netscape.com	408-982-4450
Lycos	Carnegie-Mellon University	Web crawler that indexes and abstracts Web pages by headings and keywords; licensed by Microsoft for the Microsoft Network	http://lycos.cs.cmu.edu	412-268-3830
Open Text Web Index	Open Text Corp.	Web crawler; indexes the entire Web	http://www.opentext.com	519-888-7111
PLWeb	Personal Library Service	Full-text search engine used on America Online, Prodigy, Pathfinder	http://www.pls.com	301-990-1155
Point Survey	Point Communications	Evaluations and ratings of thousands of Web sites	http://www.point.com	617-232-6200
Surfboard	Fulcrum Technologies	Web server software that offers full-text search and retrieval; licensed by Microsoft for the Microsoft Network	http://www.fultech.com	613-238-1761
Topic WebSearcher	Verity Inc.	Web server software that offers concept-based searches	http://www.verity.com	415-960-7600

This ability to find relationships can help you explore unfamiliar territory when you don't know exactly what you're looking for.

Architext is just one of several companies with software and services for slicing and dicing the Web (see the table above). Some, such as Fulcrum Technologies, Personal Library Software, and Verity, are recasting their existing text-retrieval engines for the Web. Others are finding different ways of gleaning the useful and tossing the irrelevant. Point Communications, for instance, is dis-

tion from the Web may come from Krebs & Associates, which developed InFlow to map and measure informal networks and knowledge exchanges within organizations. Valdis Krebs is now hoping to adapt the software so businesses could use it to "map intellectual capital" on the Web. Explains Krebs, "If you know what Web sites are connected and the amount of traffic among them, you could see where the common clusters of information are located and where key Web sites are."—Carol Levin

3-D Displays Without Goggles

WHEN IT COMES TO COMPUTER displays, we're living in the flatlands, trapped in two dimensions. For word processing and spreadsheets, there may not be much need for a stereoscopic, three-dimensional image, but other applications—such as virtual reality and medical modeling—are increasing the demand for 3-D.

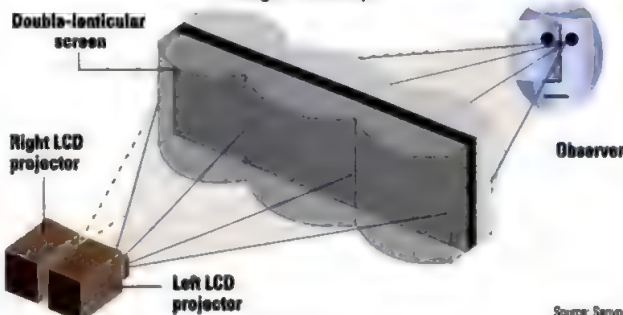
One way that we perceive distance cues is through the different images that reach our eyes; by combining two scenes, we can differentiate between parts that are close from more distant parts. Most 3-D displays rely on special eyeglasses or goggles to deliver separate images, but these approaches can be expensive and of limited practicality.

There are some exciting new approaches

to 3-D displays without goggles. Sanyo's new 3-D display uses two LCD projectors behind a double lenticular (ridged) screen.

Sanyo's Double-Lenticular Screen

Curved lenses on each side of Sanyo's screen bend light, sending separate images to each eye.



Source: Sanyo

The images are based on signals from eight separate cameras, organized in four pairs, that are interleaved in vertical columns and projected through the screen. The lenses on each side of the screen bend the light so that you only see the image from one camera at a time with one eye. The other eye sees the image from the corresponding camera.

Another approach under development at Terumo Corp. in Kanagawa, Japan, uses a pair of LCD panels along with monochrome CRTs as backlights. A half-mirror optically combines the two images. By controlling which portion of the CRTs are lit, the light can be directed to just the left or right eye. For this to work, however, lighting must be located precisely in relation to the observer's head. The display includes a sophisticated infrared tracking system that locates the observer's face, and, using a computer, calculates the "center of gravity" for that location.

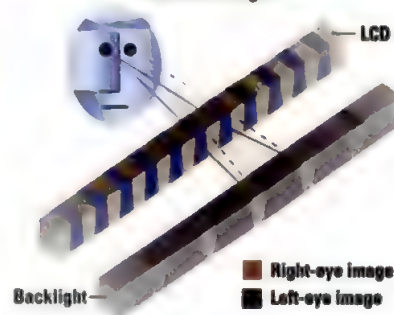
Closer to home, Dimension Technologies of Rochester, New York, has a no-goggles 3-D display that vertically interleaves a pair of images from separate cameras. The backlight is focused into thin vertical lines. Light traveling from one backlight strip will reach one eye after traveling

through a column of even-numbered pixels and the other eye after passing through odd-numbered pixels.

This provides only a small number of positions where you can see a 3-D image, so Display Technologies has developed a head-tracking system. Using a small reflective dot

DTI's Virtual Window

Display Technologies uses a special backlight to interleave images.

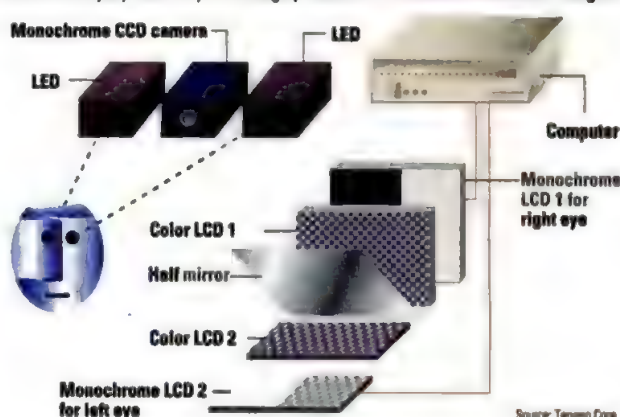


that you can put on your glasses, a set of infrared lights and sensors can track the position of your head. As you move, the display changes the position of the vertical strips of light, which in turn moves the 3-D image position to follow your head.

One of the problems with stereoscopic displays is the conflict between convergence and accommodation. When you look at a close object, your eyes turn in (convergence); when you shift focus from a distant to a near object, your eye muscles adjust the shape of the lens to focus at the proper distance (accommodation). When the focal distance is at odds with the convergence angle, some observers com-

Terumo's Split-Image Display

Terumo's display has an eye-tracking system and a half mirror to combine images.



Source: Terumo Corp.

plain of headaches or of not being able to merge the two images into a stereoscopic image. Developers are working now on decreasing the effects of convergence and accommodation conflicts.—*Alfred Poor*

Top Retail Software

Current ranking	Last issue	Product/company
1	—	Uninstaller 3 MicroHelp Inc.
2	4	YInFax PRO 4.0 Delrina Corp.
3	—	SoftRam Synchronys Software
4	—	RAM Doubler 1.0 Connectix Corp.
5	—	Internet-in-a-Box 2.0 SPRY Inc.
6	2	Procomm Plus for Windows 2.11 Datastorm Technologies Inc.
7	6	WordPerfect 6.1 for Windows Upgrade Novell Inc.
8	1	Quicken Financial Planner Intuit Inc.
9	3	MS-DOS 6.22 Upgrade Microsoft Corp.
10	8	QEMM 7.5 Quarterdeck Corp.

This list ranks PC business programs according to the total number of copies shipped to over 12,000 stores and resellers in the week ending June 3, 1995; the list cannot be interpreted as a picture of the entire software market. Adapted from a compilation by Ingram Micro.



Introducing ABC FlowCharter 4.0. The reigning business graphics heavyweight.

When it comes to creating high-quality business diagrams, new ABC FlowCharter 4.0 gives you ultimate power, flexibility and control. The program is loaded with four fully-integrated modules specifically designed to meet the demands of the business graphics user. Whether you need to create complex flowcharts for TQM and BPR, analyze your statistical data, or simply pull together clean, colorful presentation charts in a matter of minutes, ABC FlowCharter 4.0 can help you accomplish your mission. Only ABC FlowCharter 4.0 fea-

tures automatic line crossovers, intelligent line routing and data fields. And those are just a few of the features we've

added to make your life easier. Right now you can get ABC Flowcharter 4.0 for as little as \$99.95 upgrade. And you can upgrade from any business graphics program you already own. No other program gives you such complete power for so

FEATURES	ABC FlowCharter	Visio 2.0	CorelFLOW2.0
Intelligent line routing	★		
Automatic add/deletes shapes	★		
Automatic line crossovers	★		
Data fields	★		
OLE 2.0 automation	★	★	
Royalty free flowchart viewer (ABC Viewer™)	★		
Statistical Process Control Charting (ABC DataAnalyzer™)	★		
21 pre-defined diagram templates (ABC SnapGraphics™)	★		

little. If you want to settle for less, it's your business. Contact your favorite reseller or call 1-800-769-3540.

\$99.95
UPGRADE*

MICROGRAFX
CHILI FOR
CHILDREN



A RECIPE FOR HOPE

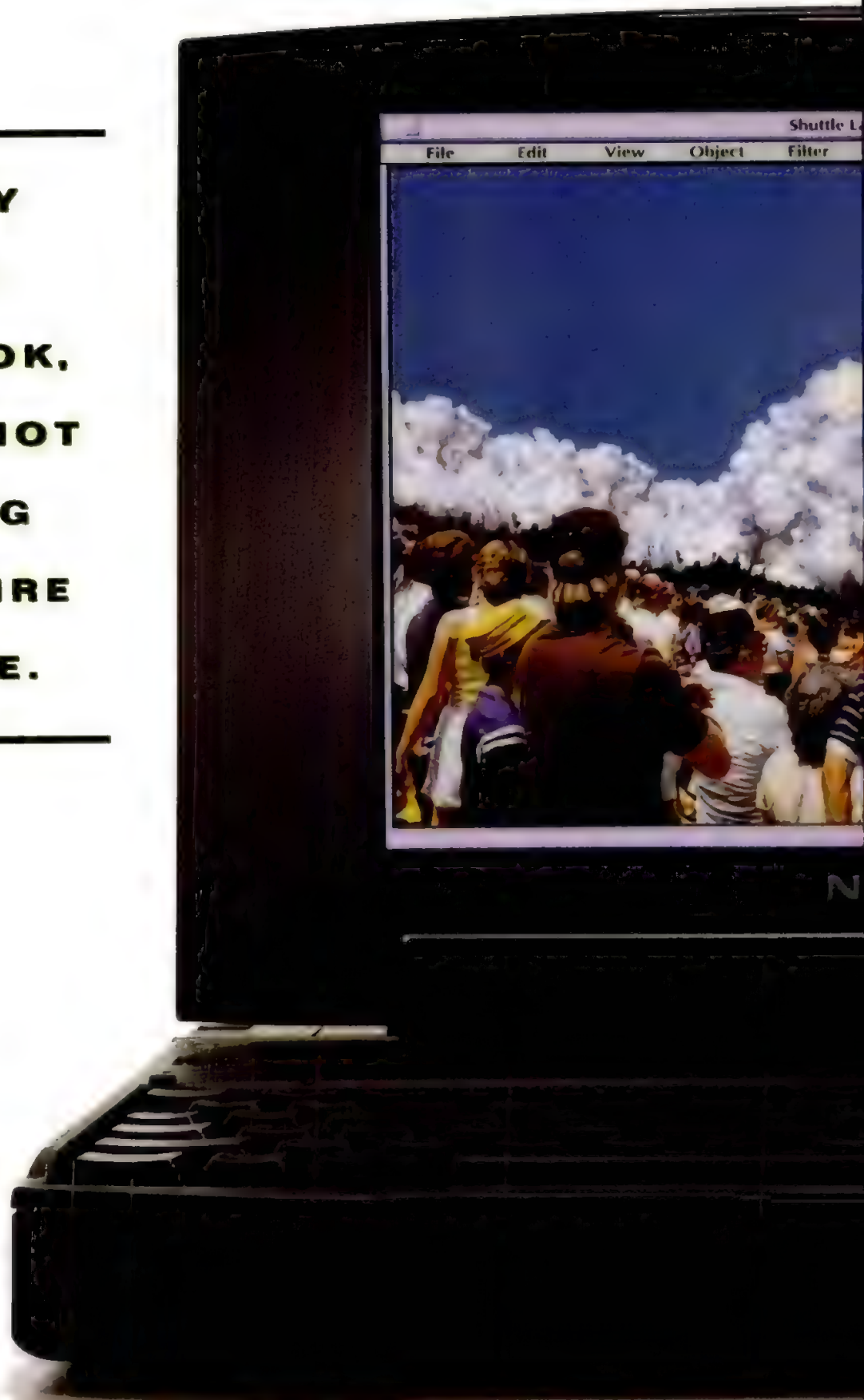


CIRCLE 381 ON READER SERVICE CARD

*U.S. SRP (\$149.95 Canadian) for users of any Micrografx product or any version of the following competitive products: Visio, CorelFlow, AllClear, Flowcharting 4, EasyFlow, or other diagramming software. Copyright 1995© Micrografx Inc. All rights reserved. All trademarks are owned by their respective companies.



**ON ANY
OTHER
NOTEBOOK,
YOU'RE NOT
GETTING
THE ENTIRE
PICTURE.**





VERSAP75

With its 10.4" high-resolution 800 x 600 screen, the new NEC Versa P displays 56% more than any other notebook.* **10.4" DISPLAY** Which means, for the first time, you can see images exactly as they



appear on your desktop SVGA monitor. All at once, and with unparalleled clarity and crispness. Add to that the power of a Pentium® processor, and the Versa P lets you work far more efficiently when multi-tasking or working on complex documents. So, is it safe to assume you'd be missing something without the NEC Versa P? Well, for starters, over a third of the picture.

For more information, call 1-800-NEC-VERSA.

SEE, HEAR

AND FEEL THE

DIFFERENCE.

NEC

*Compared to a standard 640 x 480 notebook display, NEC Versa P models feature 8 MB RAM, a Pentium® 75 MHz processor with 256K secondary cache, hard drives to 810 MB, 16-bit SoundBlaster™ sound and Indeo™ for full motion video. 10.4" screen is measured diagonally. Versa and See, Hear and Feel the Difference are trademarks of NEC Technologies, Inc. All other trademarks are property of their respective owners. © 1995 NEC Technologies, Inc. NEC USA# G800K03AG8524TP801.

Key #13522

Only U.S. Robotics lights the way...

28.800
Dual Standard
Data/Fax Modem
PCMCIA
PC Card

U.S. Robotics

Shown at 175% of actual size

Power
Send
Receive
On-Line

In the dark about your PCMCIA PC Card modem status? Turn on the lights! U.S. Robotics takes the guesswork out of portable connectivity with DataView, the only PC Card modem with LEDs. Only U.S. Robotics sheds light on your PC Card modem connection, with status indicators that instantly give you power, send/receive, and on-line information.

Based on U.S. Robotics' award-winning "V.Everything" technology, the Courier DataView is the only PC Card modem in the industry to support all three high-speed protocols: V.32 *terbo*, V.Fast Class and the industry-standard V.34.

The DataView modem also carries the standard Courier feature set: remote configuration, security and Flash ROM upgradability to keep you on the cutting edge.

Wouldn't you like to see what's going on inside your PCMCIA PC Card modem? There's light at the end of the tunnel—just call U.S. Robotics.

U.S. Robotics

1.800.USR.CORP, Extension 1212
World Wide Web address:
<http://www.usr.com>

To shed some light on the right solution for other data communications needs...



Courier "V.Everything" V.34 external and internal versions.

CIRCLE 300 ON READER SERVICE CARD

First Looks

HANDS-ON REVIEWS OF NEW SHIPPING PRODUCTS

NOTEBOOK PCs

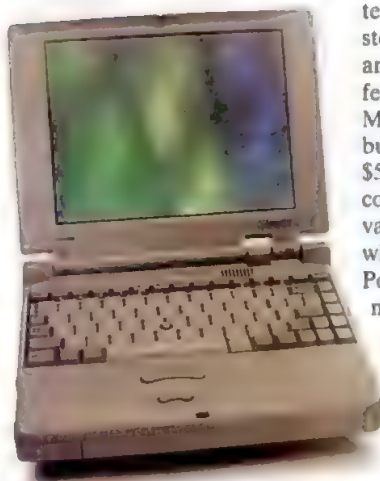
Three Notebooks That Better Balance Performance and Battery Life

Intel Corp. has stepped down the voltage needed for full-bore computing. The company's innovative split-voltage Pentium processor represents a big step forward for portable-computer design: By reducing the voltage of the processor's computing core to 2.9 volts—while keeping the I/O portion of the chip at the industry-standard 3.3 volts—notebooks can use off-the-shelf components and cut power consumption by up to 30 percent under normal circumstances.

Called Voltage Reduction Technology (VRT) by Intel, this technology lowers power consumption for a 90-MHz Pentium CPU from over 5 watts to between

2.5 and 3.5 watts for typical usage. The first three notebooks to use VRT—the Toshiba Portégé 610CT, the TI TravelMate 5000 90MHz Pentium TFT, and the Dell Latitude XPi P90T—each deliver full 90-MHz Pentium performance and improved battery life.

How much is VRT worth in terms of battery life? The TI TravelMate 5000 90MHz Pentium TFT, which uses the VRT CPU, has roughly the same 4-hour battery life as the 75-MHz TravelMate 5000 reviewed in this issue's notebook roundup, "Your Portable Persona." This gives the user of the 90-MHz system an extra 20 percent of performance potential at no cost in terms of battery life.



SMALL WONDER: The Toshiba Portégé 610CT adds a larger screen, a more powerful CPU, and EDO memory.

These split-voltage chips are just the start. Expect to see VRT CPUs that run as fast as 120 MHz by this winter.

While there were many similarities among the three notebooks tested, we found that each system stood out in a different category, and each should appeal to a different type of user. The TravelMate 5000 was the most powerful, but it comes at a high price: \$5,849. The Latitude XPi, which costs close to \$1,000 less, is the value leader of this mini-roundup, while Toshiba's redesigned Portégé 610CT continues to be a marvel of miniaturization—and one that is now up to date in terms of processor and display options.

As we went to press, Texas Instruments lowered prices on its TravelMate 5000 line of notebooks. The Editors' Choice—winning TravelMate 5000 with a 75-MHz-Pentium processor. *Continues on page 38*

POWERPC SYSTEMS

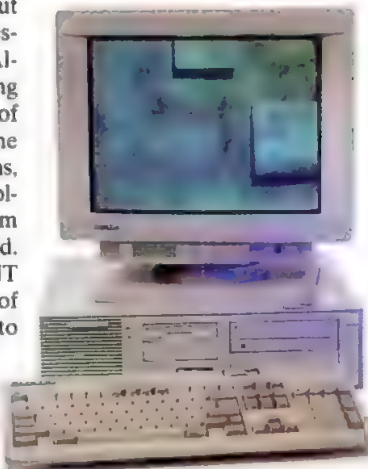
PowerPC Arrives: Fast and Inexpensive but Not for Everyone

By John Clyman

The three-year-old alliance of Apple, IBM, and Motorola that set out to undercut Intel's dominance in PC processors is finally bearing fruit. Although the PowerPC is enjoying early success in members of Apple's Power Macintosh line and IBM's RS/6000 workstations, direct challengers to the high-volume Intel/Microsoft PC platform are still nowhere to be found. With the arrival of Windows NT 3.51 for PowerPC, a number of companies are now gearing up to build mainstream PowerPC systems that don't wear Macintosh logos.

We tested two of the first systems available, the \$5,295 Austin PowerPlay 604/100 and the \$6,499 Canon Power notebook (see the sidebar "Power

Notebook: PowerPC Goes Mobile"). IBM announced its Power Series of PowerPC-based desktop



POWER ON TAP: The Austin PowerPlay 604/100 combines a PowerPC processor and Windows NT.

and notebook PCs too late to be included here.

THE PC LOOK AND FEEL

The PowerPlay is based on a 100-MHz PowerPC 604 processor; it uses a motherboard developed by FirePower Systems, an engineering firm whose founders include many members of the former NeXT hardware design team.

Inside, the machine looks a lot like a slimline PC. Austin has used standard, high-volume PC components such as hard disks and CD-ROM drives to reduce the cost of the system.

The system we tested had 32MB of RAM (expandable to 128MB) installed in its four SIMM sockets, 256K of external cache, a 1GB Fast/Wide SCSI-2 hard disk, a quad-speed CD-ROM drive, built-in Ethernet, a 17-inch monitor, and 2MB of VRAM. We used the \$6,375 AT&T Globalyst 730 with a 133-MHz Pentium CPU, a 2GB hard disk, and 4MB of VRAM for

comparative testing.

One of the PowerPlay's shortcomings is limited expandability: There are only four drive bays in all, leaving only a single bay available. Because of the high level of motherboard integration, the system's four open expansion

Continues on page 40

IN FIRST LOOKS

InvisiView	39
OmniForm	42
Uninstaller 3	42
PowerControl 2.0	44
RAM Doubler for Windows	44
Multis MultiClient Desktop	46
Systat 6.0 for DOS	47
Vizion, Version 1.1	47
Power 100	48
Symantec C++ 7.0	50
PartitionMagic for DOS and OS/2, Version 1.02	51
Advanced Turbo Browser 4.0	54
Britannica CD, Version 1.0	54
Encyclopedia Americana	54
Chief Architect 3.0	56
ClickFlick 1.0	56
GoPrint	56

First Looks

Pentium Notebooks

Continued from page 37

sor, 10.4-inch active-matrix display, and 16MB of RAM as tested in "Your Portable Persona" sells for \$5,349.

While these systems may appeal to different user profiles, all three currently represent for consumers the best way to resolve the inevitable conflicts between performance and battery life.

TOSHIBA PORTÉGÉ 610CT

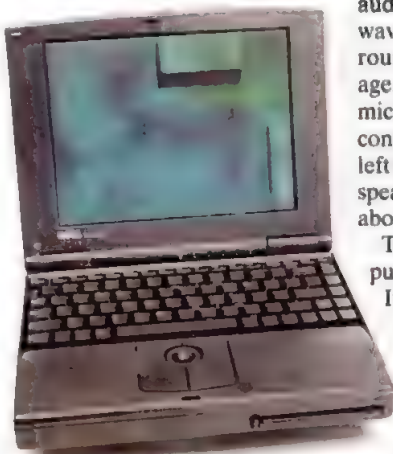
The Toshiba Portégé 610CT—a follow-up system to the Editors' Choice— and Technical Excellence award-winning Toshiba Portégé 3600CT—amazingly packs a 90-MHz Pentium processor, a 704MB hard disk, a 9.5-inch active-matrix color display, and 16-bit wavetable audio into its 5-pound 8-ounce diminutive case. This newest Portégé is also big on performance. It bested its full-size competition on two of our three Windows-based benchmark tests.

Nearly every major component of the Portégé 610CT is bigger or faster than what's found in members of the previous Portégé generation. Its processor has jumped from a 486DX2/50 to a split-voltage 90-MHz Pentium, while its hard disk capacity has more than doubled. Its display has expanded by more than an inch diagonally, and the system now boasts a memory capacity of 40MB of EDO RAM.

The greater power of these components requires the use of a cooling fan to prevent melt-down. A temperature sensor near the

CPU on the motherboard monitors the system when it is plugged in for charging. As soon as heat reaches a critical level, the fan starts up. While in operation, the fan is quiet and barely noticeable.

Toshiba ups the ante on the



COMBINATION PLATTER: The Dell Latitude XPI P90T is one of the most balanced notebooks available in terms of features, price, and performance.

new Portégé in two areas crucial to every serious road warrior: battery life and expandability. While this machine continues to run on lithium ion batteries, its new cells hold 15 percent more charge. The new Portégé also adds a second Type II PC Card slot; the unit can alternatively accommodate a single Type III device.

These additions and augmentations come at the cost of size and weight. The Portégé 610CT's footprint remains about 8 by 10 inches, but the system is slightly thicker and about 2 ounces heav-

ier than the Portégé 3600CT. Most of the additional weight is due to the larger LCD panel and the system's cooling fan.

An exciting new Portégé feature is the inclusion of 16-bit Sound Blaster Pro-compatible audio that supports MIDI and wavetable synthesis. And to round out the multimedia package, Toshiba adds speaker and microphone jacks and a volume-control thumbwheel on the front left of the case, as well as a single speaker and a microphone placed above the keyboard.

The Portégé 610CT packs a big punch in the performance arena. It out-gunned the competition on our Graphics WinMark 95 tests with a score of nearly 8.9 million pixels per second, and it outpaced the Dell and TI units on our Disk WinMark 95 tests.

Its Winstone 95 score brought up the rear, however, but only because the Portégé 610CT we tested came with 8MB of memory; the other two units were tested with 16MB. On our WinDrain test, the system was able to run for 2 hours 25 minutes between charges—half an hour longer than the average 90-MHz Pentium notebook.

The Portégé's only major design shortcoming is that you must still use the included adapter to connect the system to an external monitor. In this regard, the Portégé is ahead of the IBM ThinkPad 701C subnotebook, which requires a port replicator to make basic connections.

For maximum power in a com-

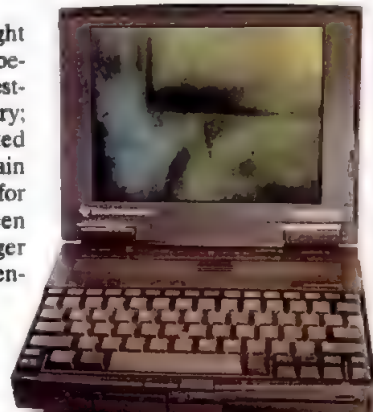
pact package, there is no product better than the Portégé 610CT.—Carol Venezia

Toshiba Portégé 610CT. Estimated street price: With Pentium/90 CPU, 8MB RAM, 704MB hard disk, 9.5-inch active-matrix color display, \$4,649. Toshiba America Information Systems Inc., Irvine, CA. 800-334-3445; fax, 714-583-3000.

Circle 432 on reader service card

TI TRAVELMATE 5000 90MHZ PENTIUM TFT

The TI TravelMate 5000 90MHz Pentium TFT will shatter any notion you may have about notebooks being too underpowered to compete with desktop PCs. With features like a split-voltage 90-MHz Pentium CPU, 256K of external cache, a PCI bus, a 10.4-inch active-matrix color display,



DOUBLE YOUR FUN: When both of the TI TravelMate 5000's lithium ion batteries are in place, the system can run for about 4 hours.

and a 1.2GB hard disk, the TravelMate 5000 comes very close to being a fully loaded desktop. But like its cousin, the Editors' Choice-winning TI TravelMate 5000 75MHz Pentium TFT, this \$5,849 notebook is priced like a well-stocked desktop system.

The TravelMate 5000 is unique because its bus provides full PCI support internally and externally. The notebook's graphics subsystem benefits from the bandwidth and speed of the PCI bus, and docking-system options and peripherals connected to the unit's external PCI connector benefit.

Texas Instruments' performance promises for this system were for the most part borne out

BENCHMARK TESTS



90-MHz Pentium Notebooks

The three 90-MHz notebooks tested were based on split-voltage Pentium CPUs. Each outperformed the average Pentium/90 unit in this issue's notebook roundup ("Your Portable Persona"), and each stood out in at least two categories. The TI TravelMate 5000 90MHz Pentium TFT was the Winstone 95 winner of the group, the Dell Latitude XPI P90 achieved the best CPUmark₉₉ score, and the Toshiba Portégé 610CT excelled on both the Disk WinMark

95 and DOSMark tests. Though all three systems posted excellent battery rundown times on our WinDrain test, the TravelMate 5000's nearly 4-hour battery life was exceptional.

We used Winstone 95, Version 1.0; WinBench 95, Version 1.0; and PC Bench, Version 9.0, to measure the performance of these notebooks. In addition, we used the WinDrain test to gauge battery life. The Latitude XPI and TravelMate 5000 had 16MB of RAM each, while the Portégé 610CT had 8MB of RAM.

Higher scores represent better performance. Red type denotes first place.	Winstone 95	Graphics WinMark 95 (Mpixels/sec)	Disk WinMark 95	DOS-Mark	CPUmark ₉₉	DOS Video	DOS Disk	WinDrain (hours: minutes)
Dell Latitude XPI P90	106	8.7	380	814	182	3,531	902	2:17
TI TravelMate 5000 90MHz Pentium TFT	114	8.8	345	739	158	2,148	588	3:52
Toshiba Portégé 610CT	90	8.4	156	471	175	3,507	822	2:25
Pentium/90 notebook average (August 1995)	105	8.8	451	616	158	3,027	397	1:55

First Looks

on our tests. The unit's Winstone 95 score of 114 was the highest here, although this was slightly below scores posted by two 90-MHz Pentium notebooks tested in this issue's notebook roundup. The TravelMate 5000's Disk WinMark 95, Graphics WinMark 95, and DOSMark scores were also very competitive. The machine stumbled only on our CPUmark₁₆ tests, with a result that was nearly 20 percent below that of the Latitude XPi and marginally below average.

The TravelMate 5000 was also an impressive performer on our WinDrain test, posting a time of 3 hours 52 minutes between charges, which is only 10 minutes less than the battery time recorded for its 75-MHz cousin. This exceptional result is due in part to the system's smart battery subsystem, which consists of two lithium ion batteries—a standard feature that neither adds to the machine's 7-pound 3-ounce travel weight nor takes the place of the floppy disk drive (which is the case for many other dual-battery notebooks). Each battery has LED indicators on the front, so you can view the charge level without removing the battery.

You'll also appreciate the ease-of-use features built into this machine. Both rear port covers flip up and disappear inside the machine (garage-door style) at the push of a button. And above the keyboard you'll find two PC Card ejector switches for the unit's two Type II slots; these make card removal a snap. The system can accommodate a Type III PC Card or a pair of Type II cards.

The TravelMate 5000 makes great strides in redefining what to expect from a desktop replacement system.—CV

TI TravelMate 5000 90MHz Pentium TFT. Estimated street price: With Pentium/90 CPU, 16MB RAM, 256K external cache, 1.2GB hard disk, 10.4-inch active-matrix color display, \$5,849. Texas Instruments Inc., Temple, TX. 800-848-3927, 512-434-1523; fax, 512-250-7329.

Circle 431 on reader service card

DELL LATITUDE XPi P90T

Dell Computer Corp. has done an excellent job of addressing the most pressing concerns of today's mobile workers with the \$4,998

Dell Latitude XPi P90T. It may not be the fastest, smallest, or longest-lasting notebook around, but the synergy of its features are such that once you see one, you'll want to take it home.

The Latitude XPi comes with a 90-MHz split-voltage Pentium processor, 256K of external cache, 16MB of RAM (expandable to 40MB), a lithium ion battery, and a 340MB hard disk. A 1.2GB hard disk is available for an additional \$900. All of this equipment is housed in a sleek case that affords easy access to the Latitude XPi's Type III PC Card and serial, parallel, and SCSI ports. The Latitude can

hold a pair of Type II PC Cards.

The Latitude XPi's 10.4-inch active-matrix display is treated with an antireflective coating that makes it easy on the eyes. All this gives you a unit that weighs in at a trim 6 pounds 15 ounces.

If its performance you want, you'll like the Latitude XPi. Its test scores were not overwhelming compared with those of its peers. Still, its Winstone 95 score of 105 and its Graphics WinMark score of 8.7 million pixels per second are nothing to shake a stick at.

Moreover, the Latitude XPi's lithium ion battery lasted a respectable 2 hours 17 minutes on our WinDrain test. And like

other Latitude batteries, this system's battery has LED indicators to show how much charge is left.

If you want the fastest, lightest, or smallest notebook on the market, look elsewhere. But if you want a little of everything without really sacrificing anything, then the Latitude XPi is the notebook for you.—*Tin Albano*

Dell Latitude XPi P90T. List price: With Pentium/90 CPU, 16MB RAM, 256K external cache, 340MB hard disk, 10.4-inch active-matrix color display, \$4,998. Dell Computer Corp., Austin, Texas. 800-613-3355, 512-289-4400; fax, 800-727-8320.

Circle 430 on reader service card

NOTEBOOK ACCESSORIES

InvisiView Makes Your Notebook Snoop-Proof

By Alfred Poor

People who used to hesitate at displaying sensitive information on their notebooks in public places, such as trains and planes, can now block prying eyes with the InvisiView screen. The

books sandwich the liquid crystal layer, which displays the computer's information, between special films that polarize light. The actual layers employed depend on the type of LCD panel used, but all include polarizing layers.

With the InvisiView panel in place, the screen looks just like the original display—only slightly brighter. With it removed, the screen appears blank.

You can still view the screen's contents without the InvisiView panel in place. All you have to do is slip on the pair of special polarized sunglasses that come with the InvisiView upgrade and then only you can view the screen's contents. One of the biggest drawbacks of the InvisiView system is that it is not available as an option on any shipping notebook.

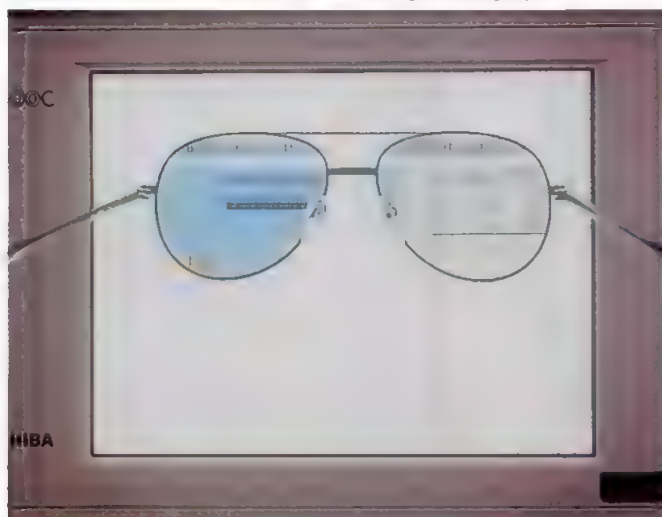
The InvisiView process is provided by Man & Machine, a company specializing in notebook repairs and upgrades. The cost is \$295 plus the price of shipping your notebook both ways. The company can perform the upgrade on most portable computers, regardless of what type of screen is used.

Man & Machine can also provide clip-on or prescription polarizing lenses as part of the package. The sunglasses are only slightly tinted, so the notebook's screen is easily readable—even in low-light situations—and colors are rendered accurately.

InvisiView is an innovative way to keep what's on your notebook's screen a secret.

InvisiView. List price: \$295. Man & Machine Inc., Hyattsville, MD; 301-277-3760; fax, 301-779-1455.

Circle 435 on reader service card



FOR YOUR EYES ONLY: With InvisiView, polarizing sunglasses are required to read the contents of your notebook's display.

\$295 upgrade from Man & Machine ensures that only you can see what's on your notebook's screen, regardless of whether your notebook has a color or monochrome display.

The InvisiView screen, which adds neither weight nor bulk to the notebook, works with your notebook's display. There is a lot of variation based on the multitude of systems out there. All note-

books sandwich the liquid crystal layer, which displays the computer's information, between special films that polarize light. The actual layers employed depend on the type of LCD panel used, but all include polarizing layers. Man & Machine strips away the top polarizing layer (along with any other filter layers present) and replaces it with a removable polarizing panel surrounded by a hard plastic frame. You can remove the InvisiView panel as you would a storm window and store it in a protective pouch. It takes just a few seconds to insert or remove the InvisiView panel.

Power PC Systems

Continued from page 37

slots should suffice. There is one full-size ISA slot, one half-length ISA slot, and two PCI slots. The system's sloppy wiring may interfere with installing a PCI card, though.

MORE MEMORY, PLEASE

For a machine that is targeted at graphics professionals, its 2MB ceiling on video RAM—sufficient for 800-by-600 resolution with 24-bit color—is somewhat limiting. Austin also sells a system that supports up to 4MB of VRAM that is capable of producing higher-resolution images and has NTSC television video input and output ports to allow frame capture.

The PowerPlay system supports 16-bit FM synthesis sound, but it's not compatible with the Sound Blaster audio standard. You can play .WAV files but not MIDI compositions.

PowerPC systems are reasonably priced and provide a lot of bang for the buck—so long as they're running native software specifically recompiled for the PowerPC chip. Right now, the native apps available are few and far between. There are a handful of high-end graphics applications on the market.

Existing 16-bit Windows apps will run on the systems in emulation mode, but with performance roughly equivalent to that of a 60-MHz Pentium PC.

We tested the PowerPlay and Globalyst 730 by timing how long

Power Notebook: PowerPC Goes Mobile

The \$6,499 Canon Power Notebook, though technologically fascinating, may be ahead of its time. Based on a 100-MHz PowerPC 603e processor—a slower cousin of the PowerPC 604 processor—the system offers all of the basics you'd expect from a high-end notebook and a few unexpected goodies.

The Power Notebook may appear familiar. That's because it uses many of the same components as IBM's ThinkPad 755CD, although the motherboard is unique.

Out of the box, it comes equipped as a high-end workstation. The hardware includes a brilliant 10.4-inch active-matrix display, 32MB of RAM (expandable to 48MB), 256K of external cache, an 810MB hard disk, a double-speed CD-ROM drive, and integrated audio. Also included: a microphone, a pair of built-in speakers, and an assortment of input and output jacks.

Measuring 2.2 by 11.7 by 8.3 inches (HWD),

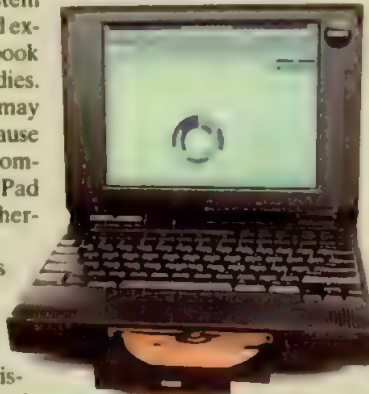
the PowerPC-based Power Notebook has a travel weight of 8 pounds. Its nickel hydride battery powered the system for about 2 hours of stop-and-go computing, without power-conservation utilities loaded.

On our application tests, we found the Power Notebook to be an able performer, although it lagged behind the Austin PowerPlay 604/100 by about 30 percent.

If you're a committed PowerPC user and are searching for a notebook, the Power Notebook is for you. The question remains whether it makes a compelling argument for passing up a 90-MHz Pentium notebook if you need a greater variety of applications. —JC

Canon Power Notebook. Estimated street price: With 100-MHz PowerPC 603e CPU, 256K of external cache, 32MB RAM, 810MB hard disk, 10.4-inch active-matrix display, CD-ROM drive, \$6,499. Canon Computer Systems, Costa Mesa, CA; 714-438-3004.

Circle 434 on reader service card



NT ON THE GO: The Canon Power Notebook uses a PowerPC CPU to run Microsoft Windows NT.

it took to complete common tasks in two graphics applications: Deneba's Canvas and North Coast Software's PhotoMorph 2.

Our results were mixed. While the PowerPlay was much better at floating-point intensive tasks like morphing two images into one and using a sharpen filter, it was slower than the Globalyst 730 at doing standard graphics chores, such as a gradi-

ent fill. On each test, however, the PowerPC-based PowerPlay was significantly faster than the Globalyst 730 when it was running Windows 3.11 rather than Windows NT.

LOOKING AHEAD

FirePower has also demonstrated motherboards that use faster 604 processors and ones that support the use of a pair of PowerPC processors in a symmetric multi-

processing system. This should nearly double performance in compute-intensive applications that exploit multithreading under Windows NT—that is, when multithreaded applications come to market.

On the whole, the PowerPlay offers a viable alternative to an x86-based PC if you spend most of your time using Windows NT applications. In that way, it's much like traditional engineering workstations running Unix—but with the added advantages of a PC-like price and a familiar operating system.

These first PowerPC-based machines are not going to change the PC marketplace overnight, but they are likely to appeal to high-end users who can never have enough power at their disposal.

Austin PowerPlay 604/100. List price: With 100-MHz PowerPC CPU, 32MB RAM, 256K external cache, 1GB hard disk, 17-inch monitor, \$5,295. Austin Computers, a division of IPC Technologies Inc., Austin, TX; 800-438-9938, 512-339-3500; fax, 512-454-1357.

Circle 433 on reader service card

BENCHMARK TESTS



PowerPC Systems

The Austin PowerPlay 604/100 provided a speed advantage over the Pentium/133-powered AT&T Globalyst 730 on floating-point-intensive tasks, namely the morphing of images and the use of a sharpen filter. In other areas, its performance was equivalent to or slower

than that of the Globalyst 730.

We tested each system with 32MB of RAM and 256K of external cache. We timed how long it took each system to complete four tasks in Deneba's Canvas and North Coast Software's PhotoMorph 2.





Now available
in a notebook.



Power and portability are no longer mutually exclusive. Now you can have both with an Intel Pentium® processor-based notebook. In fact, all of today's most demanding desktop software including office suites, multimedia and 3-D graphics, now run just as great on your notebook.

intel®

FORMS

Caere's OmniForm Scans Forms In And Fills Them Out for You

By Edward Mendelson

Caere's \$349 OmniForm is a comprehensive forms package that converts paper forms into electronic ones, creates new forms from scratch on-screen, and saves data from filled-in forms in standard database formats. OmniForm operates in two modes: a design mode for creating and modifying forms and a fill-in mode for placing information in existing forms. Caere also offers the \$99 OmniForm Filler, which

fills information into preexisting forms only.

OmniForm is an exceptionally straightforward and easy package to use. If you've used the uninformative interface on earlier Caere products, you will be pleasantly surprised by OmniForm's Wizard-like menus, which guide you through every stage of designing and filling in forms without making you learn a programming language.

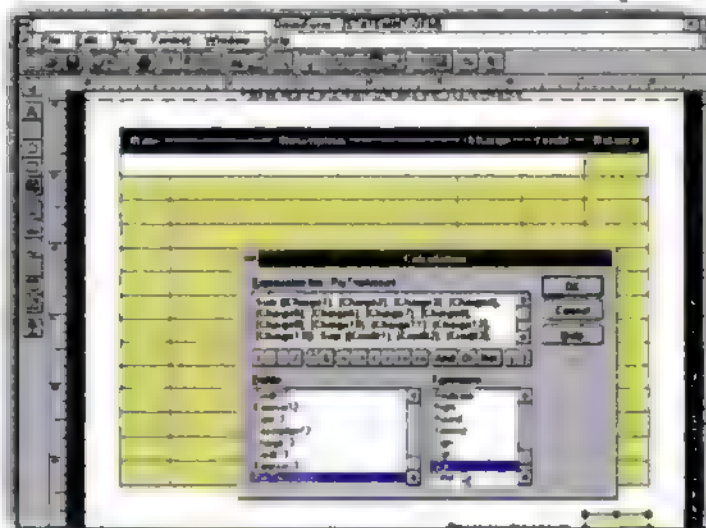
OmniForm does not have some of the advanced features of

convert some empty space into fill-in fields using OmniForm's collection of graphics design tools, but a clear, logical interface made the job easy.

OmniForm's design functions are a mixed bag. For example, if you create a field that accepts multiline text, you can place a title such as "Comment" at the start of the first line. But you have to go into a menu and tell the program to start the fill-in field on the same line at a specified numer-

ical distance from the margin; OmniForm can't automatically adjust to the width of the word.

Familiar spreadsheet functions that are accessible from a point-



BASIC MATH: A point-and-shoot menu inserts simple mathematical functions into any form.

and-shoot menu let forms perform basic calculations. You can make forms verify that data matches the field type and limit numeric entry to a specified

range. OmniForm-created forms support check boxes and "circle objects," which are words that a user can circle either electronically—by clicking with the mouse—or manually—by drawing a circle on the paper version. When a user fills in a form, the data can be automatically saved to a database linked to the form. Records can be sorted and searched or exported and imported via ODBC.

OmniForm makes complex form-creating jobs look easy, and makes much of the power of advanced forms packages accessible to anyone who can turn on a scanner and draw a graphics box.

OmniForm. List price: \$349. Requires: 8MB RAM, 8MB hard disk space, Microsoft Windows 3.1 or later. Caere Affiliate Publishing, Los Gatos, CA; 800-535-7226, 408-395-7000; fax, 408-354-2743.

Circle 406 on reader service card

FIRST LOOKS PLUS

From July 31 through August 4, you can go on-line to download a demo version of OmniForm 1.0 and discuss the product with Caere executives Edward MacBeth and Claro Villanueva, hosted by PC Magazine contributing editor Edward Mendelson. Type GO EXEC at any CompuServe! prompt.

its competitors, such as the routing options in Delrina's FormFlow and Lotus's LotusForms, and it doesn't support electronic fill-in features such as drop-down lists. And although it lets you receive fill-in data via e-mail and insert it into a database, the program doesn't support faxed forms like Cardiff's TeleForms.

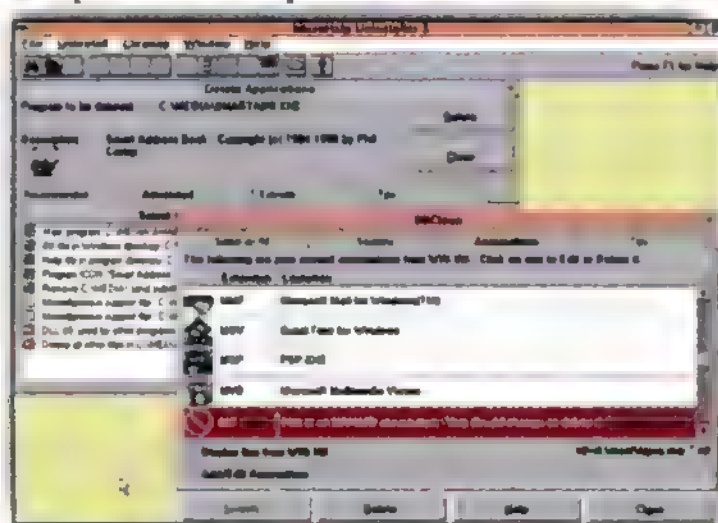
Using Caere's proven optical character recognition (OCR) engine, OmniForm can convert even complex small-print forms, such as a Federal Express airbill, into digital format. During testing, we had to correct some garbled text and

UNINSTALLERS

UnInstaller 3 Slowly Cleans, Moves, and Archives

By J.W. Olsen

Applications written for Windows 95 are expected to be able to clean up after themselves by automatically removing any indication that they were ever on your PC. Until then, Micro-



SHOUT IT OUT: Well-organized tabs, concise "tips," color coding, and icons make using UnInstaller 3 easy.

Help has revamped its \$79.95 UnInstaller 3 to move applications between drives and directories, transport them between computers, and archive them, all while continuing to remove unwanted applications and program fragments. But UnInstaller 3 is slow and can put serious burdens on your time.

UnInstaller's SmartLinks now aggressively identifies dependen-

cies among programs, related files, icons, and .INI files. This puts the program more on a par with Vertisoft's Remove-IT and Quarterdeck's CleanSweep. During informal testing, UnInstaller processed 11.5MB of application files per minute—bearable on a one-time basis. But UnInstaller frequently advised that SmartLinks were "out of synch" and needed to be rebuilt—a 25-minute operation.

UnInstaller lets you specify destinations for optional compressed backup copies of removed applications, which is similar to what you find in Remove-IT; CleanSweep doesn't offer this feature. UnInstaller is harder to use than Remove-IT, because it requires that you choose a separate menu item, and finding backups on multiple drives can be problematic.

During testing, UnInstaller occasionally didn't purge obvious .INI file entries. And the UnInstaller module that cleanses out-

dated file-type associations recommended purging associations for running Inset's HiJaak Graphics Suite off of the CD-ROM disk.

UnInstaller can move apps to other drives or directories while pointing all Windows configuration settings to the new locations. Similarly, UnInstaller's transport module packages everything to move apps to another computer, including necessary system DLLs and settings. An archive function compresses seldom-used applications to free up hard disk space. Microsoft Works compressed from 8.7MB to 4.0MB. When the application is needed, click its icon and UnInstaller restores it—albeit slowly. When we were restoring an archived utility, one of three related icons pointed to a nonexistent directory. Minor surgery fixed each problem.

Uninstall programs are only useful if they're used, and you may avoid UnInstaller 3 too often.

UnInstaller 3. List price: \$79.95. Requires: 4MB RAM, 5MB hard disk space, Microsoft Windows 3.1 or later. MicroHelp Inc., Marietta, GA; 800-777-3322, 404-516-0899; fax, 404-516-1099.

Circle 407 on reader service card

RECORDABLE CD!

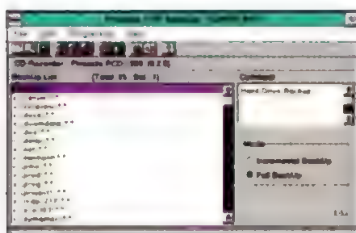
The Pinnacle RCD-1000 is 3 Drives in 1

1. **2X** Recordable CD System
2. Double-speed CD-ROM Player
3. Tape Backup Replacement



The RCD-1000™ is virtually 3 drives in 1 - making it the ultimate storage device for only \$1695.

With the flexibility of Pinnacle's RCD-1000, the applications are endless. As a **CD Recorder**, the RCD-1000 allows you to master your own CD that can be easily transported across town - or to the end of the world. As a **double-speed CD-ROM player**, it can read virtually thousands of educa-



RCD Backup Utility

tional, multimedia or audio CDs. And, with Pinnacle's own **Backup Software Utility**, you can now replace your tape drive with a system that provides a more reliable solution and fast random access to your data for only

\$19 per disc, or **3 cents** per megabyte. Each disc holds 650 MB of data, audio and video storage.

The RCD-1000 is perfect for creating and mastering your own multimedia titles, interactive games, or even mixing your own audio CD of your favorite tunes. You can backup accounting records, business plans, charts and graphs, or confidential information on CDs for decades - safe and secure.

The RCD-1000 system is simply the **best** way to store, archive, distribute and create information. Best of all, it's now affordable - it's recordable!

Pinnacle Micro. The Optical Storage Leader.

CIRCLE 098 ON READER SERVICE CARD

All Trademarks and Registered Trademarks of Their Respective Owners

TO REACH THE PINNACLE CALL: 800-553-7070

Tel: 714-789-3000 Fax: 714-789-3150

PINNACLE MICRO
THE OPTICAL STORAGE COMPANY



UTILITIES

RAM Doubler Squeezes More Memory from Your PC

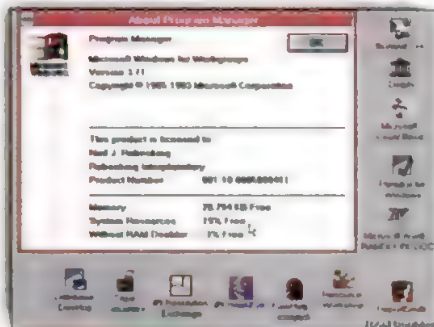
By Neil J. Rubenking

Contrary to its name, Connectix Corp.'s \$99 RAM Doubler for Windows won't actually double the amount of RAM in your system. What it will do is let you open more applications by improving the way your system deals with free system resources and conventional memory and by adding memory compression to your system's virtual memory manager.

RAM Doubler deals with the most common cause of out-of-memory errors in Windows: not a lack of physical RAM but rather a lack of free system resources. All Windows programs draw system resources from fixed-size memory blocks called *heaps*. Menus, icons, and other interface features use space in these heaps; when they're full, you can't run another program no matter how much RAM your PC has. RAM Doubler effectively doubles the size of the free system resource heaps.

Conventional memory (the first megabyte) is another scarce resource that Windows misuses. For example, Windows often allo-

memory, your system is now more likely to use all of its available RAM. But when you reach the RAM limit, Windows turns to virtual memory, swapping pages of memory to and from the hard disk. RAM Doubler enhances this process by compressing less-used pages in memory. If more memory is needed, the compressed memory pages are swapped to the hard disk.



MEMORY EXTENSION: RAM Doubler opens up room for three additional Windows apps.

cates conventional memory in instances when the plentiful extended memory would suffice, again causing spurious out-of-memory errors.

Because RAM Doubler reduces spurious out-of-memory problems caused by a shortage of system resources or conventional

Installing or uninstalling RAM Doubler is a simple one-step process with no configuration decisions required. The program is compatible with memory managers like NetRoom, QEMM, and 386Max, as well as with disk compression utilities. In operation, it's almost invisible. The only indications that RAM Doubler is loaded are an extra line in the

standard About Program Manager box and the words "RAM Doubled" in the bottom-right corner of your desktop.

In testing, we found that RAM Doubler let us open three more applications than we could without RAM Doubler. In addition, under comparable resource-intensive circumstances, we were left with 19 percent of system resources with RAM Doubler, none without. And note that this 19 percent contains twice as much actual free system resources as 19 percent without RAM Doubler, because the free system resource heaps have been doubled in size.

If you're tired of getting out-of-memory errors when there's plenty of RAM available, RAM Doubler can let you make full use of every megabyte of your PC's RAM.

RAM Doubler for Windows. List price: \$99. Requires: 4MB RAM (8MB recommended), Microsoft Windows 3.1 or later. Connectix Corp., San Mateo, CA; 800-950-5880, 415-571-5100; fax, 415-571-5195.

Circle 403 on reader service card

PRESENTATION EQUIPMENT

Reach Out and Run Your PC with the PowerControl

By Jay Munro

Once solely the domain of the couch potato, infrared (IR) remote controls are coming to PCs. SoftMagic's \$219.95 PowerControl lets you control, highlight, and accent your presentation, as well as take command of most Windows software through the

that attaches to your PC's RS-232 serial port. Installation is quick and easy, and the system comes with an adapter so that both the remote control and the mouse can be used to control a presentation.

The PowerControl comes with nine preprogrammed macros for several popular presentation programs, including Freelance Graphics, Harvard Graphics, PowerPoint, and Presentations. Macros are loaded one at a time, and depending

on the one in use, the keys carry different functions. For example, with Harvard Graphics, the Forward key sends an Enter keystroke, while with PowerPoint, it sends a Right Arrow movement command.

The remote control also has programmable buttons: Forward and Backward for paging; mouse movement arrows for up, down, left, and right; left click, right click,

and double left click; and ten user macro keys, two special-effects keys, and several blank keys.

To add emphasis to your presentations, the PowerControl comes with F/X PowerTools, a software collection that lets you draw, write, and underline with the mouse or cursor keys, or circle areas on the screen. You can spice up your show by spotlighting a specific area of the screen or prompt your audience for applause.

While SoftMagic has done a lot of work for you with the canned macros, you can also use the PowerControl's mouse macro with almost any Windows program. The program offers basic mouse control with the Up, Down, Left, and Right Arrow buttons.

In case you don't like the included macros, you can create your own by recording keystrokes. For mouse-oriented programs you can also create automated mouse movements.

While the PowerControl is clunkier and looks more complicated than Mindpath's \$299 Remote Control IR50-F/X (First Looks, September 13, 1995), it's a step forward in one respect. SoftMagic offers a free PowerControl Developers Kit (PDK), which contains documentation and software to add remote control to programs written in C/C++, C++ MFC, or Visual Basic. The PDK contains header files, import libraries, drivers, DLLs, and a VBX (for Visual Basic), along with documentation and sample code. The PDK licenses the developer to distribute its contents royalty-free.

Though slow at times, the PowerControl is an easy-to-use and flexible addition to the mobile presenter's bag of tricks.

PowerControl 2.0. List price: \$219.95. Requires: 4MB RAM, 2.5MB hard disk space, Microsoft Windows 3.1 or later, serial port. SoftMagic Corp., Waltham, MA; 800-672-9999, 617-899-9966; fax, 617-899-1458.

Circle 412 on reader service card



CLICK AND RUN: The PowerControl lets you control your PC from up to 30 feet away.

use of included macros.

The hand-held PowerControl has a range of about 30 feet and comes with a compact IR receiver

SureTrak. The most useful project management software ever.

Create reports that get results.

Whether you choose pre-defined or custom formats, SureTrak's reports keep your team informed and on track. Bring raw numbers to life by displaying activity and resource information with bar charts, time-scaled networks, and resource graphs or tables. Customize your reports with text and pictures—even send and receive project updates through E-mail.

Analyze alternatives.

It's easy to compare different approaches to your project. With SureTrak's graphical interface, there's no limit to the ways you can organize and present activity information. Multiple activity codes let you drill-down, cross-cut and pivot your data so you can analyze the project from any perspective.

Take control now.

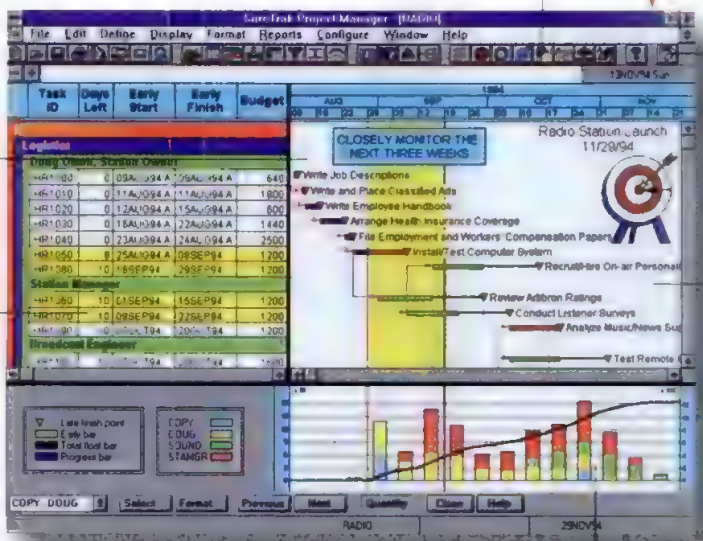
Unlike other project managers, SureTrak makes it easy to track who must do what, when, and how. Use Spotlight™ to focus on a graphical to-do list. Then use Spotlight again to update your progress and record what it takes to complete the project.

Get started quickly.

An animated tutorial takes you on a quick tour of SureTrak's fundamental features—and the extensive help system is only a click away. SureTrak even reads Microsoft Project files, so you can take control immediately without losing any of your previous work.

Plan projects effectively.

Planning your projects with SureTrak is easy. Simply outline activities, estimate the time to complete each one, and link them together. Make scheduling changes on-screen as you go, and see them instantly reflected in your plan. It's called dynamic control and only Primavera has it.



Stick with the experts.

As the leading developer of project management software, Primavera has designed SureTrak to be an integral component of its Concentric Project Management™ software tool set—integrated, scalable tools for managing people, teams, and projects.

Leverage resource availability.

SureTrak alerts you to workload crunches and shows when resources are over- or under-used. Coordinate the entire team by leveling resources according to their availability and the priorities you specify.

The chart shows why long-time users of Microsoft Project are switching to SureTrak—it's better. But don't take our word for it. Try it yourself for 60 days. If you don't agree that SureTrak is the best project management software you've ever used, send it back for a full no-questions-asked refund.

The No Comparison Comparison		
	SureTrak	Project
Progress Spotlight™	✓	
User-definable activity and resource IDs	✓	
Professional-quality reports	✓	
Data pivoting using 24 activity codes	✓	
Read/Write .MPX and .P3 files	✓	only .MPX
Mail-enabled	✓	✓
Maintenance™	✓	✓
BASIC scripts	✓	✓

 **PRIMAVERA**

How the world says project management

Let SureTrak go to work for you today for just \$299.

Call 1-800-973-1335 or fax or mail this coupon to (801) 973-9725, Primavera Systems, Inc., SureTrak Division, 1574 W. 1700 S., Salt Lake City, Utah, 84104. Please include \$5.00 with your payment for shipping and handling (\$304.00 total).

Name: _____ Company: _____
 Address: _____
 City: _____ State: _____ Zip: _____
 Phone: _____ Fax: _____
 PC/MC/AMX # _____ Signature: _____

**60-Day
No-Risk
Money-Back
Guarantee**

PCs

Digital's Multia: Windows NT Meets X Window

By Mark Jonikas

If you've been looking for a networked desktop PC that runs Microsoft Windows NT as well as it runs X Window, Digital Equipment Corp.'s Multia may end your search. The \$3,495 (base price) Multia, with a 166-MHz Alpha processor and no monitor, can run both Windows NT and X Window applications, and its Desktop Service software lets users get direct access to these applications by simply clicking on the corresponding icon. The system's greatest strength is its ability to connect to a wide variety of mini- and mainframe computers.

The Multia is housed in a compact chassis that is strong enough to support a 21-inch monitor. The \$5,395 system we examined had a 233-MHz Alpha chip, a 528MB SCSI hard disk, a floppy disk drive, and 32MB of RAM. The system comes with 24MB of memory standard (expandable to 256MB) on its extremely compact motherboard.

DEC assumes most users will be accessing networked applications or will download applications from servers. As a result, the Multia's base configuration has no floppy disk drive and only a 340MB hard disk.

All Multia models have a PCI-based graphics accelerator and built-in audio hardware. The higher-end models offer one free PCI expansion slot. In addition, all Multias have SCSI-2, serial, and parallel ports and a pair of Type II PC Card slots. Unfortunately, the system can't accept a Type III PC Card.

NETWORK WONDER

Network administrators will be impressed by the ease with which client workstations can be configured in the Multia environment and by how security can be enhanced by limiting users' involvement in application setup.

For network support, the Multia has a built-in auto-sensing Ethernet adapter with thick, thin, and twisted-pair connections. Preinstalled software supports Net-

BEUI, NetWare, and TCP/IP connections in addition to Digital's DECnet, LAT, and Pathworks.

The system is also well designed for upgrades and maintenance. The back opens with two screws, and two thumb screws release the Multia's motherboard and allow it to slide out of the chassis.

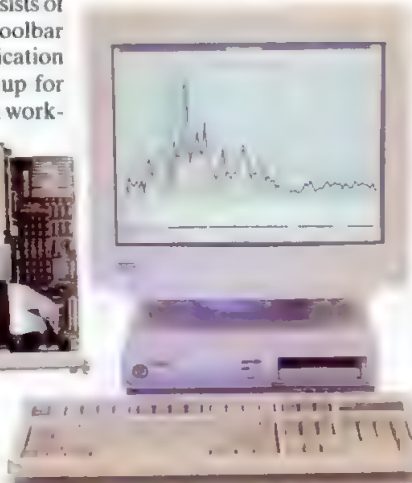
The Multia desktop consists of an Application Manager toolbar that includes any application icons that have been set up for that system. To simulate a workgroup environment in our tests, we set up one Multia as an administration machine and another as a client on an Ethernet network.

You can configure on the group level by selecting the Configuration Manager icon or locally by selecting the Multia icon. In either case this assumes the administrator has all the required rights for the setup. It should be noted that the Multia's workgroup organization is separate from Windows NT's workgroup structure.

From the Configuration Manager, the administrator can select

either a group or an individual computer to bring up the Customize menu, which displays a configuration diagram. Clicking on the appropriate icon in this diagram allows remote configuration of hardware, software, security, or other attributes of a user's environment.

Once a workgroup environ-



DEC DOES WINDOWS NT: Multia's strength lies in its ability to run both Windows NT and X Window applications. Its motherboard (inset) is one of the smallest around.

ment is created, new computers can be added to this group, each with its own user key. A user who switches on a Multia for the first time will be prompted for the user

key. This prompts the server to download the entire configuration onto the user's machine. The Multia makes remote configuration as easy as being at the individual workstation.

MANY WINDOWS, ONE MACHINE

The Multia's strongest attribute is its ability to connect to a variety of systems. X Window applications can easily be set up from the Multia's own environment. The Run X application menu in the Configuration Manager prompts for the TCP/IP address of an X Client, a log-on name, and a password. The Multia functions as a highly optimized X11.R6 server in native mode. The system is also capable of native 3270 emulation.

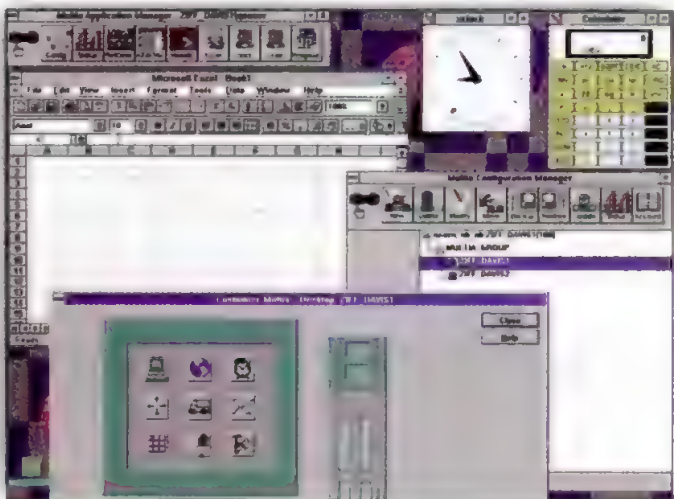
To test the Multia's configuration capabilities further, we configured the client Multia to run Microsoft Excel from a remote Windows NT server. The setup could not be performed from the Multia desktop alone, although only the Multia administration server needed to perform the Windows NT administration tasks. First we set up Excel on the Windows NT server so that all the DLLs used were in the same directory as the executable. Next we set up the Multia administrator account on the Windows NT server and assigned it domain-administration rights.

Within the Windows NT environment on the Multia, the log-on had to be reset from a Workgroup to the Windows NT Server, and the Multia administrator had to log onto the Windows NT Server. Once this was done, the directory containing Excel could be shared by the Multia administration machine.

Central configuration control and easy desktop access to multiple hosts are the key strengths of the Multia. Organizations running X Window applications and considering migration to Windows NT should consider it.

Multia. List price: With 233-MHz Alpha processor, 32MB RAM, 528MB SCSI hard disk, 512K external cache, \$5,395. Digital Equipment Corp., Maynard, MA; 800-777-4343, 508-467-7880; fax, 508-467-1926.

Circle 429 on reader service card



CUSTOMIZED ICONS: The Application Manager toolbar includes any application icons that have been set up for that system.

STATISTICS

Systat 6.0 for DOS: Everyday Statistics for Scientists

By Craig Stinson

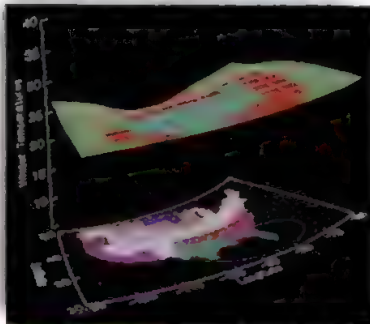
Appearing in its first new version under the SPSS corporate banner (SPSS acquired Systat last September), the venerable statistics program Systat for DOS has undergone a total rewrite and major functional changes. Systat 6.0 for DOS (\$995) now is easier to use, includes a slew of new mathematical functions, and places no constraints on the complexity or size of your data.

The big change from Version 5.0 is the end of the 256-variable limit. Users can now work with data sets of any size, subject only to the constraints of available extended memory. In addition, new statistical procedures have been incorporated, including discriminant analysis, log-linear modeling, path analysis, quality-control charts, design matrices, and matrix algebra.

Systat's extensive graphing component has been given an object-oriented makeover and has been thoroughly integrated into the rest of the product. Graphs are no longer contained in a separate module; now they are simply a menu selection. Users can display graphs while working in any statistical procedure. With the help of a pop-up Graph tool, users can annotate graphs, rearrange axes in 3-D space, and apply analytical transformations, all without leaving the graphics view.

The variety of Systat's graphics options is as impressive as its breadth of statistical features. In addition to the customary bars, lines, pies, histograms, and scatter charts, the program offers density displays, probability plots, icon plots, Fourier plots, maps, pyramid charts, sploms, high-low-close plots, bubble pots, and more. The program's nearly 2,000-page manual is complete; it even includes a chapter called "Cognitive Science and Graphic Design."

By themselves, the improvements to Systat's graphics engine make the program significantly



SEEING NUMBERS: Systat 6.0 excels at visually portraying numerical trends.

more usable, and it rivals some of its Windows-based competitors. But Systat remains a lean and gritty, no-nonsense statistical en-

gine for those who find graphical user interfaces, on-screen tutorials, hypertext help systems, and other PC modernities burdensome.

The program uses a character-based system of cascading pull-down menus, and some of the documentation is devoted to tutorial topics, but Systat is for the scientist who is familiar with statistics and prefers to keep the graphical user interface fuss to a minimum. Like previous versions, Systat 6.0 also includes a full Basic-like programming language and maintains a history of your menu activity, so

you can bypass the UI altogether and drive the program with scripts.

SPSS plans to follow this release with a 16-bit update to Systat for Windows by the end of the year. The company will continue to position this and subsequent versions of Systat for DOS as a tool for the scientific and research community—for those doing experimental and observational research on a daily basis. Systat 6.0 carries on the program's tradition of functioning as a powerful but not mainstream statistical tool.

Systat 6.0 for DOS. List price: \$995. Requires: 4MB RAM, 6MB hard disk space, DOS 3.3 or later. SPSS Inc., Chicago, IL; 800-543-9262, 312-329-2400; fax, 312-329-3668.

Circle 408 on reader service card

INTERNET

Vizion Can Put Your Internet Life in Order

By Bill Harrel

Remembering and entering the 10- to 30-character addresses needed to navigate the Internet and the World-Wide Web can be a nerve-racking and tedious chore. Just as Windows rescued us from typing in obscure commands, Sirsi Corp.'s \$49.95 Vizion 1.1 can minimize the monotony of dealing with Internet site addresses. While Vizion is a good place to organize your Internet excursions, it does little to help you manage the information you gather.

Similar in concept to the CompuServe Information Manager (CIM) or America Online's interface software, Vizion provides a point-and-click graphical interface for connecting to the Internet's myriad services. The program works by assigning Internet addresses to categories, or *folios*, as Sirsi calls them. Once you've found an interesting destination, you can easily assign it to a folio and give it a name and an icon. After that, the site is a double-click away.

To get you started, Vizion in-

cludes over 1,400 destinations that cover a variety of business, scientific, and news-related topics. But all you get is a list of site names and colorful icons. Sirsi could have made Vizion more helpful by supplying a short description of each site, a sample of what is available, and an on-line service to update addresses as well as add new ones.

Vizion makes getting around

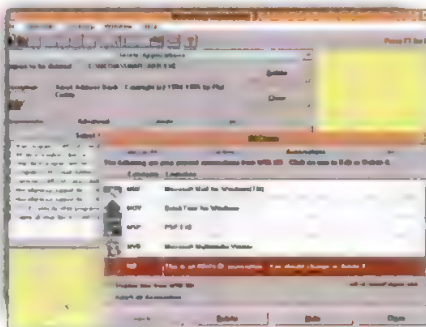
and install most of the programs you need. Vizion includes an FTP (File Transfer Protocol) application but ignores the software needed for Veronica, Gopher, World-Wide Web, e-mail, and other Internet functions.

Other Internet access programs, such as Netcom's NetCruiser and Netscape's Navigator, not only provide automatic client configuration and all the software you'll need to explore the Internet, they also help you find the nearest access connection point and establish a provider account.

If you're already up and running and have a little Internet savvy, Vizion can help you manage destinations with minimal fuss. If you're thinking of logging on to the Internet for the first time, though, you might want to check out some of the other navigation programs available.

Vizion, Version 1.1. List price: \$49.95. Requires: 4MB RAM (8MB recommended), 5MB hard disk space, Microsoft Windows 3.1 or later, Internet SLIP or PPP or local area network (LAN) access. Sirsi Corp., Huntsville, AL; 800-242-2233; fax, 205-836-5587, e-mail, vizinfo@sirsi.com.

Circle 409 on reader service card



CLICKER CENTRAL: Vizion's icon-based interface includes 1,400 Internet sites for organizing your favorite destinations.

the Internet easier, but it does nothing to help you get up and running. If you're new to the Internet, the process can be daunting and confusing.

While Vizion launches the appropriate utility to connect to the requested site, you'll need to get

MACINTOSH SYSTEMS

Power 100: The Macintosh's Identical Twin in Everything but Price

By Sebastian Rupley

Get set for a healthy Macintosh clone market to develop. That's our conclusion after putting the first Mac clone, Power Computing's \$3,298 Power 100 system, through its paces. When tested for performance and compatibility, the Power 100 stacks up very well next to a Macintosh. This unit will give Apple a run for its money.

Power Computing Corp. chose to enter the Mac clone market at the high end. The Power 100 system is similar to Apple's industrial-strength 8100/100 system in configuration, performance, and focus. The two big differences are price and appearance: The Power 100 is more than \$1,000 cheaper and uses a standard desktop case in lieu of Apple's sleek enclosure; a tower version is also available.

The system we tested

came with the 100-MHz PowerPC 601 processor, 16MB of RAM, a 730MB hard disk, a 14-inch monitor, and a quad-speed CD-ROM, which mirrors the 8100/100 in all areas except for the Macintosh's double-speed CD-ROM drive. The Power 100 comes with ClarisWorks 3.0, Quicken 5.0, and a trial subscription to America Online. The Apple system doesn't.

nents on a card rather than on the motherboard. There is a custom slot for the I/O card in addition to three open NuBus slots. The sys-



POWER CLONE: Power Computing's Macintosh clone may look like a PC, but it is a Macintosh under the skin. Its motherboard (see inset) uses a card for I/O and audio.

and OS/2 files. Our system had a Quantum 730S hard disk with Macintosh System 7.5 preloaded; the maximum internal hard disk capacity is 9GB.

As in Apple Macintosh systems, the Power 100's 15-pin video adapter and VGA adapters are designed to provide for cross-platform peripheral options. With only 2MB of on-board VRAM standard, however, the upgrade to 4MB is highly recommended for those who will be running graphics- and video-intensive applications.

Is the Power 100 as fast and compatible as a Mac? Based on our evaluation, the answer is yes on both scores. On the Ziff-Davis MacBench CPU, FPU, Disk, and



Video benchmark tests, the Power 100 system posted results that were within a few percentage points above or below the scores of the 8100/100 system. There was one notable exception: The Power 100's quad-speed CD-ROM drive more than doubled the performance of the Apple 8100/100's double-speed drive on the MacBench CD tests. Our system was also equipped with CDT Toolkit, a caching CD-ROM driver that contributed substantially to performance.

During testing we also ran an array of Adobe PhotoShop filters on the Power 100 side by side with the 8100/100 system and found the systems' graphics per-

formance virtually indistinguishable.

We were equally impressed with the Power 100's compatibility. We threw a variety of old and new Macintosh applications at it and encountered no problems. Power Computing reports that its systems are tested in Apple's compatibility labs, and Power Computing's support personnel complete Apple's training program. The Power Computing systems are manufactured by CompuAdd in Austin, Texas.

START AT THE TOP

Power Computing offers a 30-day money-back guarantee and toll-free technical support for the life of the system. The company also runs an interesting World-Wide Web site (<http://www.powercc.com>), which includes a useful price estimator that can adjust for differing configurations; Power Computing can also be reached at info@powercc.com.

Those who were hoping for a bargain-basement Mac clone will have to wait. Power Computing intends to offer the Power 80, a sub-\$2,000 system based on the 80-MHz PowerPC 601 chip, but the timing is vague.

In the meantime, the \$3,298 Power 100's performance and compatibility make it an excellent Mac alternative at the high end, whether or not you are pinching your pennies.

Power 100. List price: With 100-MHz PowerPC 601 CPU, 8MB of RAM, 256K cache, 730MB hard disk, 14-inch monitor, quad-speed CD-ROM drive, \$3,298. Power Computing Corp., Milpitas, CA; 800-999-7279, 408-526-0500; fax, 408-526-0545.

Circle 411 on reader service card



From July 24 through 28, you can go on-line to discuss Power Computing's Macintosh clones with marketing executive Bob LeVitus and PC Magazine senior editor Sebastian Rupley. Type GO EXEC at any CompuServe! prompt.

IT'S WHAT'S INSIDE THAT COUNTS

The Power 100's guts aren't pure Macintosh, but they're about as close as you can get. The motherboard design is somewhat different from a Mac's; this is where Power Computing saves on manufacturing. Unlike most Mac systems, the Power 100's board design puts I/O and audio compo-

nent also has 256K of external processor cache, built-in Ethernet, dual asynchronous SCSI buses, and two serial ports to facilitate LocalTalk attachments, modems, or other devices.

The standard Power 100 configuration includes 8MB of RAM (expandable to 200MB) and a 3.5-inch floppy disk drive that can read Macintosh, Windows, DOS,

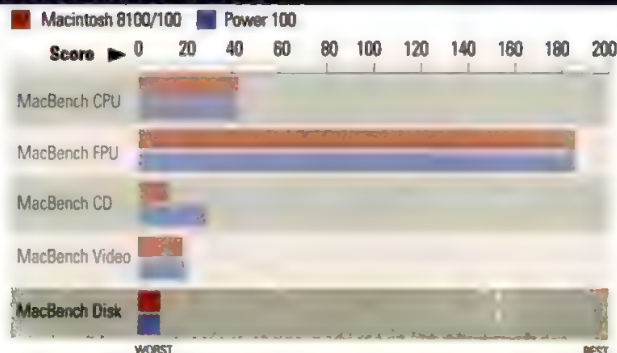


Power 100

Our testing showed Power Computing's Power 100 to be a value-oriented alternative to Apple's Macintosh 8100/100.

We used Ziff-Davis's MacBench to test CPU, FPU, CD, video, and disk performance. Each system was equipped with 8MB of RAM and 256K of external cache.

BENCHMARK TESTS



Code Name: mON z-mopuim



etition In The Wake ...



1. Follow instructions on the other side

Back

Gbslilpback-0018



Inverted Back

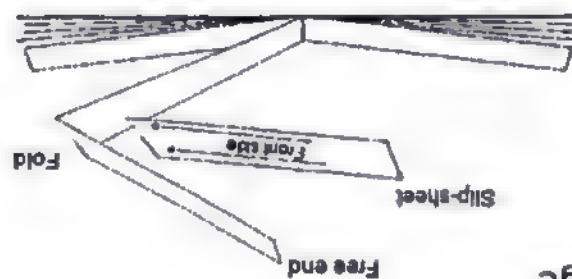
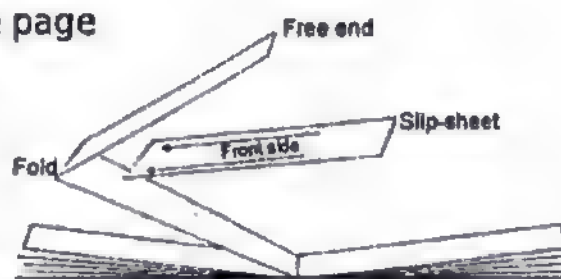
1. Follow instructions on the other side

Folded edge of the page



Inverted Foldout slip-sheet

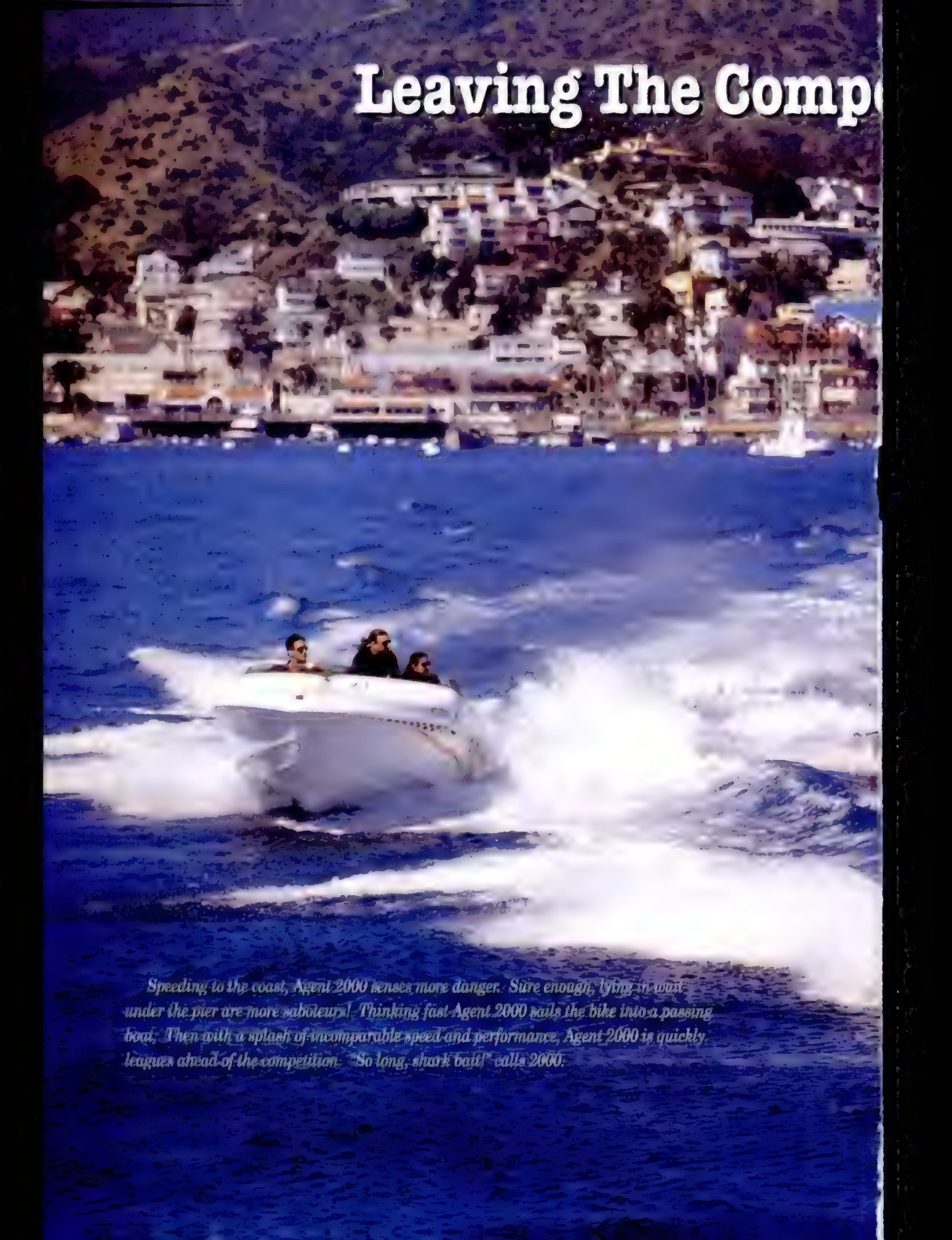
1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet

Foldout slip-sheet

Leaving The Comp



Speeding to the coast, Agent 2000 senses more danger. Sure enough, lying in wait under the pier are more saboteurs! Thinking fast Agent 2000 sails the bike into a passing boat. Then with a splash of incomparable speed and performance, Agent 2000 is quickly leagues ahead of the competition. "So long, shark bait!" calls 2000.

Agent 2000 Is On A Mission!

The journey begins with the competition in hot pursuit. But it will take a lot more than they've got to overtake Agent 2000. The perfect combination of speed and power give Agent 2000 the outstanding performance to stay ahead of the pack. "I know just the trick," thinks 2000. And with that, the 133-horsepower kicks in, leaving the competitors in the dust.

The exchange went off without a hitch. Soon the city lights would be far behind. At dawn, Agent 2000 must begin the journey back. When the metallic briefcase is safely returned to headquarters in North Sioux City, South Dakota, the mission will be complete. The happiness of computer users everywhere is at stake. For in the briefcase is Gateway 2000's Secret Code — a new way to bring all PC users the latest computer technology at the best value on the planet. Undaunted by thoughts of the competitors' plans to thwart the mission, Agent 2000 keeps cool and races ahead to ensure all Gateway 2000 customers tomorrow's technology today.

The Best Performance

Gateway 2000's dossier is filled with accounts of great feats to bring PC users the latest computer technology and unmatched performance. It's our strategy to ensure all Gateway customers the tools to take them far into the future.

P5-133XL!

In a quest that took us to the ends of the earth, we brought you "Fastest PC in the World" — Gateway's P5-120XL (May 1995, *PC/Computing*). Now we've outdone ourselves by introducing the Gateway 2000 P5-133XL, a computer that's **significantly** faster than the fastest PC in the world! Equipped with a 133MHz Intel® Pentium® processor, 16MB EDO performance-enhanced memory, 256K pipelined burst cache, 1.62GB IDE hard drive with Mode 4 support, Matrox® MGA™ Millennium™ 2MB WRAM (Windows RAM) graphics accelerator and a 4X three-CD changer, this machine is powerful and fast enough to navigate you through any risky computing situation!

Matrox MGA Millennium

It's no secret, if you want graphics that come alive the Matrox MGA Millennium is the graphics accelerator for you! Using the latest in video and memory technology, the MGA combines a highly integrated 64-bit graphics accelerator featuring 3-D acceleration and video playback with WRAM, a fast dual-ported video memory for increased video performance. It's perfect for use with upcoming 32-bit Windows 95 applications, multimedia software or 3-D intensive applications.

EDO (Extended-Data-Out) Memory

The next time you've masterminded an unforgettable plot, you'll want plenty of memory to back you up. EDO performance-enhanced memory gives you high-speed memory for your memory-intensive graphics, demanding number-crunching applications and future multi-tasking environments like Windows™ 95. And the combination of EDO memory and pipelined burst cache, on 120MHz and 133MHz systems, gives you the latest memory technology and the performance of next-generation cache, increasing system performance up to 20 percent!



GATEWAY2000
You've got a friend in the business.™

8 0 0 - 8 4 6 - 2 0 6 3

2000 Defends All PC Buyers!



With a flight suit for take off, agent 2000 is abuzzed! In a flash of arm and legs, the unworthy soon get by overthrown. They cannot defeat 2000's sheer will and determination to deliver the best features, quality and value to all PC buyers.

95



The Best Features

Gateway 2000® beats the competition to the punch with the world's best features!

TelePath 28.8™ Fax/Modem Communication Center

Access a world of information at the touch of a button using the TelePath 28.8 fax/modem Communication Center. Standard or available as an upgrade on all Gateway desktop systems, the TelePath has a 28,800bps modem and a 14,400bps fax. Combined with the included FaxWorks™ software, it provides a complete Communication Center. You get an answering machine and access to today's online world. Also included with the TelePath 28.8 fax/modem Communication Center are trial memberships to CompuServe®, America Online® and Prodigy®.

Software

You can have action and excitement for the whole family — and the tools to conquer all *your* special missions. Gateway outfits you with incomparable software applications on all our systems. Choose a Family PC™ multimedia system and be transfixed by Gateway's new Generations Software Collection including 51 software programs! Professional Gateway PCs include Microsoft® Office Professional 4.3, the world's number-one selling software suite. And all Gateway desktop PCs include MS Windows® for Workgroups 3.11 — the fastest version of Windows available (today).

Vivitron™ Monitors

Electric color, a razor-sharp focus and crystal clear images — all from a Gateway 15- or 17-inch Vivitron monitor! These monitors feature Sony® Trinitron® tube technology — technology that the most discerning viewers have relied on for decades.

The Best Service and Support

Gateway 2000 delivers another powerful blow to the competition by providing all our customers with award-winning, **toll-free** technical support for the life of their Gateway system! All Gateway desktop systems and monitors are also covered by a three-year limited warranty. Write or call us for a free copy of our warranty.

The Best Quality

For nearly 10 years, Gateway 2000 has prevailed when it comes to bringing PC buyers the highest-quality computer components available — the best we can possibly offer. The evidence speaks for itself with the MS Mouse, Gateway's programmable AnyKey® keyboard, and of course, our trademark cow-spotted boxes!



8 0 0 - 8 4 6 - 2 0 6 3

It's A Quick Getaway With



The Best Portable PCs

Don't be fooled by stripped-down portables posing as great values. They'll just leave you up in the air without the performance that you really need. Outsmart them by choosing Gateway 2000[®]'s high-performance portables, the Liberty[™] and ColorBook.^{2™} They're loaded with the power to handle the increasing demands of today's (and tomorrow's) technology.

Performance

When your special assignments take you out in the field, have outstanding performance without anything to weigh you down. Free yourself with the 4.2-pound Gateway Liberty portable PC. The DX4-100 Best Buy model includes 100MHz of processing

power with 256K L2 cache for Pentium[®] processor-like performance. Gateway also gives you plenty of RAM that will increase battery life and improve your overall system performance! With 24MB RAM and a 720MB hard drive, the Liberty DX4-100 Best Buy gives you the speed and power to run all your hard core applications without a snag.

Features

The Liberty's sleek 4.2-pound design delivers all the goods with a 10.4-inch screen, infrared technology, an impressive battery life and incredible software applications pre-installed.

The screen display on your portable should be a crucial buying factor. Our 10.4-inch color screen on the Liberty produces vivid



Gateway 2000's portable PCs - the ColorBook² and Liberty.

GATEWAY 2000[®] LIBERTY[™]

- 4.2 Lbs., 10" x 8" x 1.6"
- 10.4" DSTN Color Display
- 1MB Video RAM
- Choice of Desktop IR Receptor or External Floppy Drive
- Intel[®] 486 DX2 or DX4 Processor
- Instant On
- Battery & AC Pack
- 2 PCMCIA Type II Slots
- EZ Point[™] Integrated Pointer
- Removable Hard Drive
- 78-Key Keyboard
- Parallel, Serial, VGA & PS/2[®] Ports
- OAG[®] FlightDisk[®], World Clock, & Ascend[®] personal information manager (PIM) for use w/ Franklin Day Planner[®]
- MS-DOS[®] 6.22 & WFW 3.11
- Microsoft[®] Windows[®] 95 Upgrade
- Microsoft[®] Works for Windows[™] 3.0 or MS Office Professional 4.3**

LIBERTY DX4-100 Base

10.4" DSTN Color Display, 8MB RAM, 340MB HD, MS Works

\$2999

LIBERTY DX4-100

10.4" DSTN Color Display, 16MB RAM, 540MB HD, 256K L2 Cache, MS Works

\$3749

LIBERTY DX4-100

Best Buy 48-Hour QuickShip*
10.4" DSTN Color Display, 24MB RAM, 720MB HD, 256K L2 Cache, TelePath[™] 14.4 XJACK[®] Fax/Modem, Leather Carrying Case, Desktop IR Receptor, External Floppy Drive, MS Office Professional 4.3**

\$4499

COLORBOOK[™]

COLORBOOK² DX4-100 Deluxe

16MB RAM, 540MB HD, Port Replicator, Carrying Case, MS Office Professional 4.3**

\$3499

COLORBOOK² DX4-100

Best Buy

24MB RAM, 720MB HD, TelePath 14.4 Fax/Modem, Carrying Case, CD-ROM, Port Replicator, MS Office Professional 4.3**

\$4499

- 5.7 Lbs., 11.65" x 8.5" x 1.77"
- 10.3" DSTN Color Display
- Intel 486 DX4 Processor
- Minimum 8MB RAM (expandable to 24MB)
- 1.5MB Video RAM (includes 512KB cache)
- Removable Hard Drive
- 3.5" Diskette Drive
- Integrated 16-Bit Sound and Speaker
- Battery & AC Pack
- EZ Point Integrated Pointer
- 2 PCMCIA Type II Slots
- 85-Key Keyboard
- Parallel, Serial, VGA & PS/2 Ports
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- MS Works for Windows 3.0 or MS Office Professional 4.3**

LIBERTY PROFESSIONAL PACK

MS Office Professional 4.3, PCMCIA TelePath XJACK 14.4 Fax/Modem, Extra NiMH Battery, Leather Carrying Case
\$449

**48-Hour QuickShip program applies only to the Liberty DX4-100 Best Buy configuration. Your PC will be delivered within two business days from the time of order. No additions or deletions can be made to the configuration. Available for approved credit card orders only while quantities last. Domestic U.S. orders only. Call us for details about other QuickShip offers.*

***MS Office Professional 4.3 includes Word, Excel, PowerPoint[®] presentation graphics program, and Access[®] database. Available only at the time of purchase.*



Toll free from Canada
800-846-3609



Toll free from Puerto Rico
800-846-3613

PORTABLE SALES

8 0 0 - 8 4 6 - 4 3 2 0

610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 800-846-4526
Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

SERVICE AND WARRANTY

- Lifetime portable-specific toll-free service and support
- One-year limited parts warranty
- 30-day money-back guarantee
- Special VIP warranty. We'll ship a replacement to you within 24 hours during warranty. Only available at the time of purchase for an additional \$100.

PERIPHERAL OPTIONS

- Panasonic[®] KXL-D720 external CD-ROM drive **\$299**
- ColorBook² port replicator **\$49**
- PCMCIA 14.4 XJACK send/receive fax/modem **\$159**
- PCMCIA network adapters, twisted pair **\$129**
- Coaxial adapters **\$159**
- Token Ring adapters **\$399**

*When we last saw
Agent 2000, a.k.a.*

Undercover Agent Monique, she had just arrived at Gateway 2000 headquarters with the metallic briefcase containing the Secret Code. Safely inside President Ted Waitt's office, she removed her mask and boldly revealed her true identity. They then waited for the time-release lock on the briefcase to open.

"Ted!" exclaimed Monique, "The time-release lock has finally opened!" Ted and Monique open the briefcase to find an encrypted CD. They quickly pop it into a CD-ROM drive and discover — "AZMEJMTGKCNMRXJ." "Quick Monique, this code is hot, hand me my code book! — Ah, here it is ..."

PC buyers, the wait is over! Microsoft® Windows® 95 is now included with every Gateway 2000 system at no extra cost, and it will be sent to you upon release. If you already own a Gateway PC, you can order a Windows 95 upgrade on CD today for only \$99!

Gateway 2000 has worked tirelessly to prepare for the unprecedented release of Windows 95. We've readied our product line by loading cutting-edge technology into value-packed systems optimally configured to run this new operating system.

With Windows 95, your PC will become easier to use, faster and more powerful than ever before. And you can enjoy the benefits of true multitasking and "Plug and Play." We will provide toll-free Windows 95 technical support including installation, configuration and problem-resolution assistance to customers who purchase Windows 95 from Gateway. The best hardware to run Windows 95 combined with phenomenal service — a Windows 95 deal like this can only be found at Gateway 2000!

"Holy cow, Ted! Gateway's Windows 95 program is ground breaking, just like our next mission — making Gateway 2000 an industry leader in service and support. Extended service hours and next-day replacement parts are just the tip of the iceberg! Gateway's new service plan ..."

"Monique," interrupted Ted, "there are two things I know for sure — Gateway 2000 is the best place to buy a PC on the planet, and the Secret Code is disintegrating and eating a hole in my desk!"



8 0 0 - 8 4 6 - 2 0 6 3

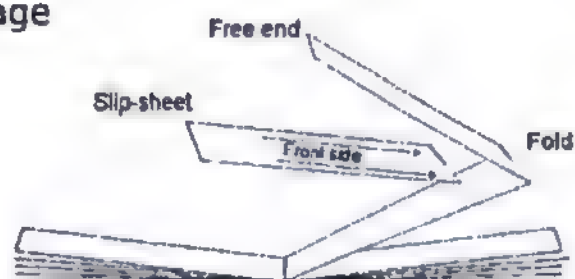
Inverted Foldout slip-sheet



GbsSlipSheet-001

Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Open the foldout page

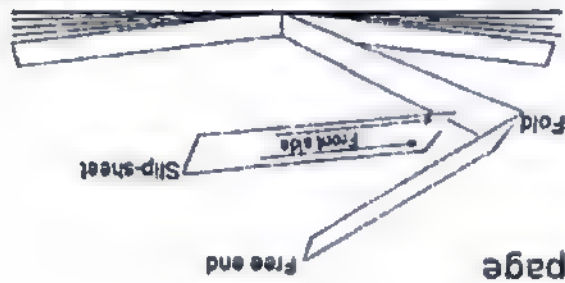
2. Insert this sheet with

1. Front side touching the free page

2. Arrow pointing to the fold

3. Slice the folded edge

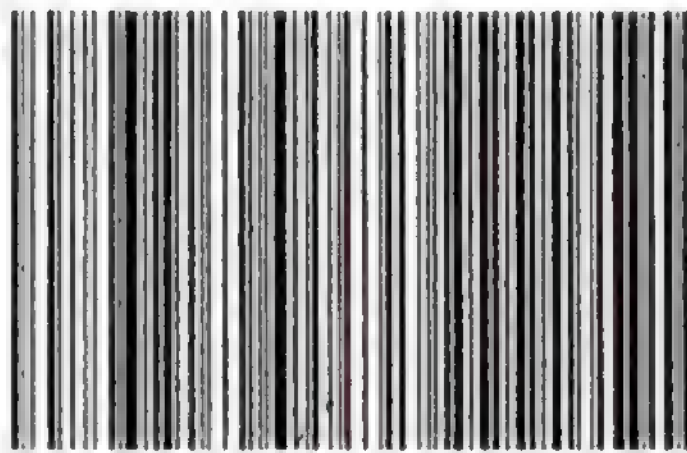
4. Close the page and slip-sheet



Folded edge of the page

1. Follow instructions on the other side

Inverted Back



GbsSlpBack-0018

Back

1. Follow instructions on the other side

Gateway 2000 Portables!



color, brightness and clarity. You'll also find that the 10.4-inch screen has 23 percent more viewing area than a 9.4-inch screen, allowing you to see more spreadsheet cells, full word processing documents, and giving you the ability to read small fonts better.

The Gateway Liberty adds even more mobility with its infrared (IR) technology. Using wireless file transfer, you can transfer files between your Liberty and desktop (or between two Liberty PCs!) without cables. IR is also important for tomorrow's portable computing needs. Windows® 95 was engineered with IR in mind, and IR-ready printers will be available soon.

Not enough battery life and suddenly your portable PC isn't much help! The Liberty gives you battery life of up to four hours or

more with power management. It was also designed to be upgradable to lithium ion batteries.

The value of your Gateway portable PC goes up, up, up with pre-installed software applications. All Gateway portable PCs include Microsoft® Works for Windows® 3.0 or MS Office Professional 4.3 pre-installed. You also get the OAG® FlightDisk®, World Clock, and Ascend® software applications.

Looking for ways to make your getaways more productive? Call a Gateway 2000 portable sales representative today!

Gateway 2000® Family PC™ Systems

4DX2-66 FAMILY PC

- Intel® 66MHz 486DX2 CPU*
- 8MB RAM
- 540MB 11ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- 2X CD-ROM, 16-Bit Sound Card & Altec™ ACS-5 Speakers
- TelePath™ 14.4 Fax/Modem Communication Center
- 3.5" Diskette Drive
- 14" .28 CrystalScan® Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS® 6.22 & WFW 3.11
- Microsoft® Windows® 95 Upgrade
- Generations Software Collection
- 3-Year Limited Parts Warranty

\$1649

P5-75 FAMILY PC

- Intel 75MHz Pentium® Processor*
- 8MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM, 16-Bit Sound Card & Altec ACS-5 Speakers
- TelePath 14.4 Fax/Modem Communication Center
- 3.5" Diskette Drive
- 15" .25dp Vivitron™ Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- Generations Software Collection
- 3-Year Limited Parts Warranty

\$2199

P5-90 FAMILY PC

- Intel 90MHz Pentium Processor*
- 8MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM, 16-Bit Sound Card & Altec ACS-5 Speakers
- TelePath 28.8 Fax/Modem Communication Center
- 3.5" Diskette Drive
- 15" .25dp Vivitron Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- Generations Software Collection
- 3-Year Limited Parts Warranty

\$2499

P5-100 FAMILY PC

- Intel 100MHz Pentium Processor*
- 16MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X 3-CD Changer, 16-Bit Sound Card & Altec ACS-5 Speakers
- TelePath 28.8 Fax/Modem Communication Center
- 3.5" Diskette Drive
- 15" .25dp Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey® Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- Generations Software Collection
- 3-Year Limited Parts Warranty

\$2999

Professional Systems

4DX2-66

- Intel 66MHz 486DX2 CPU*
- 8MB RAM
- 540MB 11ms IDE Hard Drive
- PCI Enhanced IDE Interface
- PCI Local Bus Graphics with 1MB
- 2X CD-ROM
- 3.5" Diskette Drive
- 14" .28 CrystalScan Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- MS Works 3.0 & Money 3.0
- 3-Year Limited Parts Warranty

\$1449

P5-75

- Intel 75MHz Pentium Processor*
- 8MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 32-Bit PCI Graphics Accelerator w/ 1MB DRAM
- 4X CD-ROM
- 3.5" Diskette Drive
- 15" .25dp Vivitron Color Monitor
- 7-Bay Desktop Case
- 101-Key Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- MS Office Professional 4.3**
- Bookshelf® & Money 3.0
- 3-Year Limited Parts Warranty

\$1999

P5-100

- Intel 100MHz Pentium Processor*
- 16MB EDO Performance-Enhanced Memory
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM
- 3.5" Diskette Drive
- 15" .25dp Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- MS Office Professional 4.3**
- Bookshelf & Money 3.0
- 3-Year Limited Parts Warranty

\$2599

P5-120 BEST BUY

- Intel 120MHz Pentium Processor*
- 16MB EDO Performance-Enhanced Memory
- 256KB Pipelined Burst Cache
- 1GB 10ms IDE Hard Drive
- PCI Enhanced IDE Interface
- 64-Bit PCI Graphics Accelerator w/ 2MB DRAM
- 4X CD-ROM
- 3.5" Diskette Drive
- 15" .25dp Vivitron Color Monitor
- 7-Bay Desktop Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- MS Office Professional 4.3**
- Bookshelf & Money 3.0
- 3-Year Limited Parts Warranty

\$2999

P5-133XL

- Intel 133MHz Pentium Processor*
- 16MB EDO Performance-Enhanced Memory
- 256KB Pipelined Burst Cache
- 1.62GB 9ms IDE Hard Drive w/ Mode 4 Support
- PCI Enhanced IDE Interface
- Matrox® MGA™ Millennium™ 2MB WRAM Graphics Accelerator
- 4X 3-CD Changer
- 16-Bit Ensoniq® Wavetable & Altec ACS-31 Speakers w/ Subwoofer
- TelePath 28.8 Fax/Modem Communication Center
- 3.5" Diskette Drive
- 17" .26dp Vivitron Color Monitor
- 9-Bay Tower Case
- AnyKey Keyboard & MS Mouse 2.0
- MS-DOS 6.22 & WFW 3.11
- Microsoft Windows 95 Upgrade
- MS Office Professional 4.3**
- Bookshelf & Money 3.0
- 3-Year Limited Parts Warranty

\$4399



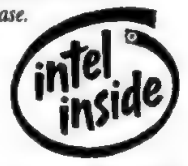
- Microsoft® Encarta™ 95 • MS Bob™ • MS Money 3.0 • MS Works 3.0 • MS Publisher 2.0 • MS Publisher Design Pack • MS Cinemania® 95 • MS Bookshelf® • MS Composer Collection: Beethoven, Mozart and Schubert • MS Wine • MS Arcade: Missile Command™, Asteroids, Tempest™, Centipede® and Battlezone™ • MS Dinosaurs • Mayo Clinic® Family Health Book • and Mayo Clinic Family Pharmacist • plus 31 popular MS entertainment games.

If you can't find a system that suits your needs, call us and we'll be happy to custom build one for you.

****MS Office Professional 4.3 includes MS Word, Excel, PowerPoint® presentation graphics program, and Access® database.**



Printed on recycled paper with soy inks.



pentium
PROCESSOR

*Intel Verified: Upgradable



Toll free from Canada
800-846-3609

Toll free from Puerto Rico
800-846-3613



"You've got a friend in the business."®

8 0 0 - 8 4 6 - 2 0 6 3

610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 800-846-4526
International FaxBack Access 605-232-2561 • Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

ALL THE GATEWAY GOODS!

Incredible values from Gateway 2000®. Peripherals and software sold only with the purchase of a system.

Communications & Storage

TelePath™ 28.8 Fax/Modem Communication Center

Revolutionize your communication needs with the TelePath 28.8 fax/modem Communication Center. Internal fax/modem, 28,800bps modem, V.34, with 14,400bps fax capability. Sends and receives faxes, and sends and saves voice messages. Includes CD containing CompuServe®, Prodigy®, and America Online® trial memberships. **\$149** (TelePath 14.4K Fax/Modem \$79)

Colorado Memory Systems® Jumbo™ 1400 TBU

CMS Jumbo 1400 internal tape backup unit with up to 136GB compressed (680MB native) storage capacity per tape. Comes with MS Windows™ and DOS® software, one tape and cable. **\$199**

Multimedia

New 4X Three-CD Changer

Enhance the value of your PC with the 4X three-CD changer. It supports multi-session photo CDs and XA format, enabling simultaneous audio and data with additional hardware. You'll have access to three times the amount of information of a regular CD-ROM drive and the ability to switch between programs.

\$100 (upgrade from 4X CD-ROM)

\$150 (upgrade from 2X CD-ROM)

Audio Multimedia Kit

Here's everything you need to add multimedia to a Gateway PC.

- Gateway 2000 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with MIDI/game port, mic in, stereo line in/out
 - 2 Altec™ Lansing ACS-5 speakers
- \$99** (with system purchase)

Wavetable Audio Multimedia Kit

Once you've heard wavetable audio, basic audio will never do!

- Ensoniq® Soundscape™ 16-bit wavetable sound card, MT-32 and FM mode compatible. Supports most software for popular sound cards and standards including General MIDI, Sound Blaster, AdLib, Roland MPU 401, MS Windows Sound Sytem and MT 32
 - New Altec Lansing ACS-31 three-piece speaker system
 - Blue Ribbon Sound Works' SuperJAM! jr. software
- \$209** (with system purchase)
\$110 (upgrade from systems with 16-bit sound card and Altec speakers)

Networking

3Com® Ethernet Adapters

High-performance 16-bit Ethernet cards.

16-bit Triple Media Card with BNC, AUI and RJ-45 connectors **\$109**

16-bit Card with only RJ-45 connector **\$89**

SMC® PCI Ethernet Adapter

32-bit card with both RJ-45 and BNC connectors **\$149**

Olicom Token Ring Adapter

16/4 ISA Card with STP and RJ-45 connectors **\$279**

Software

Microsoft Windows 95 Upgrade

Call today and order your copy of Windows 95, Microsoft's new operating system, on CD (shipped after its release). You won't be charged until it ships. Offer good through December 31, 1995. **\$99** (Windows 95 on diskette, \$109)

Special Starter Pack

Tuneland™, Mad Dog McCree™, Mayo Clinic® Family Health Book, Better Homes and Gardens Healthy Cooking CD Cookbook™, The Lawnmower Man™, Sitting on the Farm™, CD Deluxe Pack 1.0 MPC including Mavis Beacon Teaches Typing!™ 2.0, U.S. Atlas 4.0, World Atlas 4.0 and Chessmaster 4000. **\$59**

Sports Pack

Six action-packed sports applications. Includes Unnecessary Roughness '95™; Hardball 4™; FIFA International Soccer; PGA Tour® Golf; NHL® Hockey '95; and NASCAR® Racing. Also includes Gravis GamePad™ and CD holder. **\$99**

Kid's Backpack™

Seven exciting software applications specifically for kids with Sesame Street® Numbers; My First Incredible, Amazing Dictionary; The Cat Came Back; The Yukon Trail™; Keroppi Day Hopper; Math Blaster®; In Search of Spot; and Sing-Along Kids™. Also includes a 20-disc storage rack and microphone. **\$99**

Monitors

Gateway 17-Inch Vivitron™ Color Monitor

Non-interlaced color monitor using Sony® Trinitron® tube technology, capable of 1280 x 1024 resolution in non-interlaced mode, .26 dot pitch.

Upgrade from a 14-inch CrystalScan® 1024NI monitor **\$400**

Upgrade from a 15-inch CrystalScan monitor **\$320**

Upgrade from a 15-inch Vivitron monitor **\$275**

(Upgrade prices good only at the time of system purchase.)

Printers

Epson® Stylus™ Color Ink Jet Printer

Features 360dpi high-quality print resolution and 720dpi for more brilliant colors on specially coated paper. Exclusive technology produces a precise dot. Includes parallel cable. **\$559**

Hewlett-Packard DeskJet 540 Printer

Features clear, sharp 600 x 300dpi black printing on plain paper with a variety of built-in typefaces. Color option also available. Includes parallel cables.

\$299 (w/out color) **\$339** (w/color)

New Epson ActionLaser 1400 Laser Printer

Features a high-performance RISC-based processor optimized to perform operations in fewer clock cycles than a standard CISC, as well as 600 x 600dpi with edge smoothing technology. Includes cables. **\$499**

Call for other printer options.

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers. You can also apply for the Gateway 2000 DuoLine™ MasterCard® card, issued by Dial National Bank, Des Moines, Iowa.



8 0 0 - 8 4 6 - 2 0 6 3

Call the Gateway 2000 special component add-ons division at 800-846-2080 for our complete line of extras for Gateway customers.

Sales hours: 7am-10pm Weekdays (CDT).

© 1995 Gateway 2000, Inc. Gateway 2000, AnyKey, CrystalScan, black-and-white spot design, "G" logo and "You've got a friend in the business" slogan are registered trademarks, and DuoLine, Family PC, Kid's Backpack, Vivitron and TelePath are trademarks of Gateway 2000, Inc. The Intel Inside Logo, Intel, Pentium and OverDrive are registered trademarks of Intel Corporation. Trinitron is a registered trademark of Sony Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. Monitors' diagonal measurements indicate the size of the cathode-ray tube. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping or applicable sales tax.

PROGRAMMING LANGUAGES

Symantec C++ 7.0 Leads the Race for Faster Applications

By Richard Dragan

Although still in development during our recent roundup of compilers ("Significant Development," April 11, 1995), Symantec C++ 7.0 is now on the scene and proves to have been worth the wait. The \$199 programming package is not only the fastest C-based applications-development environment we've seen, it offers unprecedented tools for creating and maintaining code, eases the transition to 32-bit programming, and addresses several weaknesses found in Microsoft Visual C++. Symantec C++ 7.0 is so integrated that it challenges rapid-applications-development environments such as Borland's Delphi and Powersoft's PowerBuilder in terms of the ease and speed of building applications.

The key to working with C++ 7.0 is its Integrated Development and Debugging Environ-

bugged in another, and browsed classes in a third.

Symantec provides an assortment of tools that automate applications development. Creating a

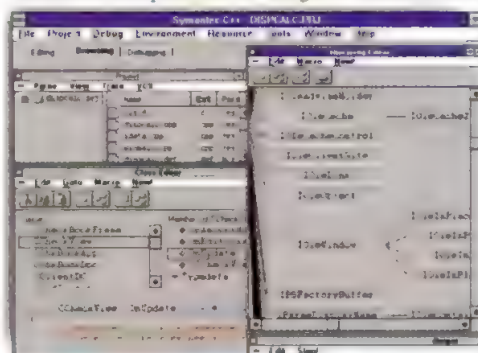
application. AppExpress lets you select which kind of MFC application to generate; for instance, SDI- or MDI-format. There is no way to select individual MFC features,

however, such as the document/view model or print preview.

To customize the MFC application, we had to use a series of dialog boxes. The compiler then generates a shell application framework. The sample application we created compiled more than 90,000 lines of code.

The ClassExpress tool is Symantec's version of the Microsoft Visual C++ ClassWizard or the Borland C++ ClassExpert. Using this tool, Windows events—such as menu commands, keystrokes, or mouse clicks—can be attached to snippets of C++ code within MFC classes. ClassExpress took care of the nitty-gritty for us—such as modifying the MFC message maps—and automatically derived the new classes based on existing MFC classes.

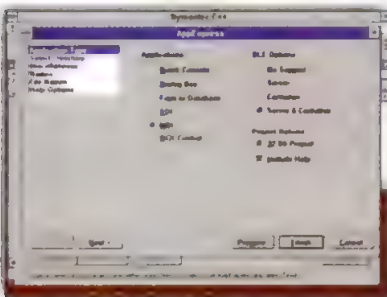
For 16-bit Windows applications, C++ 7.0 adds VBExpress, a tool that allows the attaching of C++ code to Visual Basic .VBX controls. Strangely, this feature is not disabled when you work in 32-bit mode, even though MFC 3.0 doesn't support .VBX classes.



ALL ABOARD: Symantec C++ 7.0's ProjectExpress targets current and future 16-bit and 32-bit Windows platforms, including Microsoft Windows 95.

C++ 7.0 application starts with the ProjectExpress tool. Those familiar with Microsoft Visual C++ Wizards or Borland C++ Experts will quickly understand the sequence in C++ 7.0. The ProjectExpress tool lets you select your target options, including 16- or 32-bit Windows or DOS/DOSX applications or libraries, as well as Microsoft Foundation Class (MFC) targets. MFC capabilities include OLE 2.0 support for both servers and containers. The ProjectExpress tool also works with the emerging .OCX (OLE control) standard.

After you've selected a build target, the C++ 7.0 AppExpress helps to generate a default MFC



INSTANT APP: The AppExpress generates a default MFC application, automatically including support for OLE 2.0.

ment (IDDE). If you've felt confined by the MDI (Windows' Multiple Document Interface) convention of Visual C++ or Borland C++, look no further. C++ 7.0's IDDE uses dockable windows that can be placed anywhere on the desktop.

WINDOW MANAGEMENT

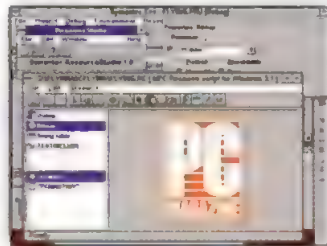
To help manage the more than one dozen windows available, C++ 7.0 has a tabbed control box that presents the most common workspaces or sets of views for editing, browsing, debugging, disassembly, and output. On a high-resolution monitor, we edited source code in one window, de-

DRAW-AND-DROP CLASS STATUS

The C++ 7.0 Hierarchy Editor and Class Editor tools are a big step forward. The Hierarchy Editor for C++ 7.0 breaks new ground by letting the programmer create and connect C++ class entities visually by dragging them with the mouse. In this way, we derived new classes based on old ones. After we finished, the program generated the header (.H) and .CPP files to represent our classes, along with the class derivations.

At that point we could still modify the class hierarchy. C++ 7.0 lets the programmer toggle back and forth between the source code and the visual representation of class entities.

The C++ 7.0 Class Editor uses a three-pane window that shows



VISUAL APPEAL: The ResourceStudio can create Windows resources such as icons, bitmaps, and dialog boxes.

the classes, the methods, and the data members associated with your application. This tool shows the code in classes and can serve as a command center for editing and maintaining code. Unlike earlier class Wizard tools, the Symantec Class Editor works with all your existing C++ code, including MFC and non-MFC code.

The Class Editor goes to work even before you compile a line of

BENCHMARK TESTS



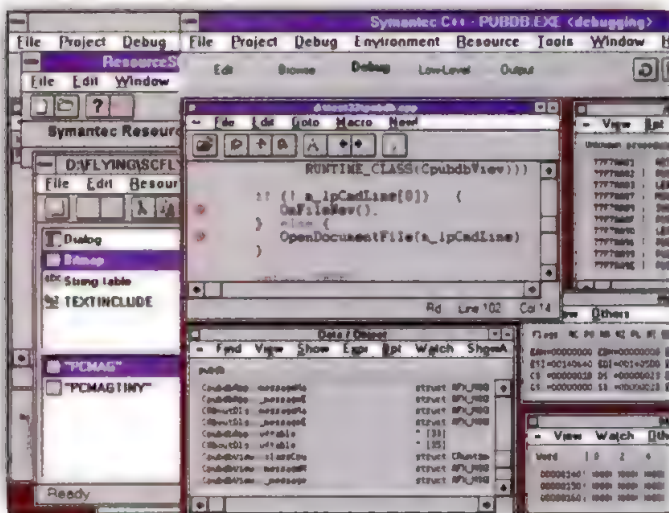
Symantec C++ 7.0

Symantec C++ 7.0 achieved a clean sweep on our 32-bit C++ compiler tests. The sample application that we created in Symantec C++ 7.0 was smaller and faster than those produced by the best products in our last C-compiler roundup (April 11, 1995)

We used Microsoft Windows NT 3.5 running on a 486 DX2/66 PC with 24MB of memory at 800- by 600-pixel resolution



First Looks



EXTERMINATOR: C++ 7.0's Multiscope Debugger delivers powerful graphical debugging, including source and disassembly windows.

code by parsing code in the background for class information. For old-fashioned source-code editing, the editor windows in C++ 7.0 include support for well-known editor styles such as Brief and Epsilon, syntax highlighting, and cutting and pasting code in columns, as well as support for a macro scripting language. A welcome addition is the ability to create a clone of your editor files by clicking on the New menu option.

Within the C++ 7.0 environment, the Resource Editor is an OLE 2.0-compliant resource editor that lets you create bitmaps, icons, menus, dialog boxes, and other resources, including Windows 95 resources. You might still prefer the interface of the Borland Resource Workshop, but Symantec provides a capable set of resource-editing tools.

In addition, the Multiscope Debugger for C++ 7.0 has impressive capabilities. Much like the Windows resident debugger in Visual C++ 2.x, the Multiscope Debugger can work with multithreaded applications for Microsoft Windows NT or Windows 95. Source-code disassembly is provided, as is the ability to set breakpoints and watches. C++ 7.0 even has a Spy-like capability to display Windows messages as they are delivered to your application.

Our performance testing of C++ 7.0 shows that its visual approach and ease of use don't come at the price of slow operation. Using the same test-bed we

used in our recent C++ compiler story, Symantec C++ 7.0 now leads the 32-bit compiler market. Compared with the best in each category, the program produced consistently faster build and debug times in generating 32-bit executables for Microsoft Windows NT 3.5, as well as smaller and faster executables. Our testing in 16-bit character mode told a slightly different story: C++ 7.0 was competitive, but it was behind the market leaders in some

categories we looked at, including executable size.

RESOURCE POOLING

In large organizations, there is a way to improve build times further. Symantec offers the Optilink linker, which has long been used by developers to combine the abilities of networked computers. For those developers facing build times measured in hours, not minutes, Symantec includes NetBuild, a distributable build utility that lets you distribute this CPU-intensive task across PCs on a LAN.

With its new features, Symantec C++ 7.0 makes up for several weaknesses in Visual C++ 2.x/1.51 while maintaining backward compatibility. Besides the licensed versions of the latest MFC class libraries, the Symantec compiler uses the Microsoft file format for debugging information. C++ 7.0 can work in both 16-bit and 32-bit modes, and you can target 16-bit and 32-bit executable files using the same tools. Visual C++ 2.x is 32-bit only, and 16-bit programmers need to use Visual C++ 1.51, which doesn't support the newest C++ features such as templates, exception handling, and runtime data.

In a world where RAD tools such as Borland's Delphi and Powersoft's PowerBuilder let developers deliver finished applications to users before a basic library of C++ objects has been designed and written, tools such as Symantec C++ 7.0 give programmers a choice. Symantec C++ 7.0 anticipates what C++ compiler tools will look like: more automation, more visual programming, and an iterative model of design and testing where classes can be modeled visually even before you write a line of source code.

With its exceptional speed, cutting-edge visual approach to managing code, 16-bit and 32-bit compatibility, and extensive C++ language support, Symantec C++ 7.0 delivers some of the most advanced features available in today's C++ compiler market. **Symantec C++ 7.0.** List price: \$199; upgrade, \$99.95. Requires: 16MB RAM (20MB for 32-bit development), 85MB hard disk space, Microsoft Windows 3.1 or later (with Win 32s extensions) or Microsoft Windows NT, CD-ROM drive. Symantec Corp., Cupertino, CA; 800-441-7234, 503-334-6054; fax, 503-334-7400.

Circle 404 on reader service card

UTILITIES

PartitionMagic: The Safe Way to Repartition Disks

By Neil J. Rubenking

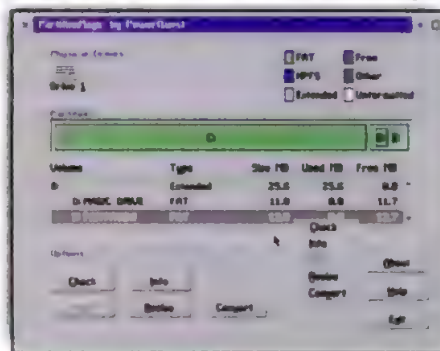
Repartitioning a hard disk is not for the timid, but Pow-

erQuest's \$69 PartitionMagic for DOS and OS/2 tames the worst terrors. Before PartitionMagic, changing a disk's partition structure wiped out all data on the partition and thus required a complete backup and restore. PartitionMagic modifies the partition structure nondestructively, although to be on the safe side,

PowerQuest recommends backing up your data anyway.

PartitionMagic will also convert a DOS file allocation table (FAT)

partition to OS/2's High Performance File System (HPFS), and its check-disk function is a super-



QUICK-CHANGE ARTIST: PartitionMagic shrank the C: partition, making room for the extended partition and logical partitions D: and E:.

fast replacement for the standard CHKDSK utility. Though PartitionMagic is OS/2-oriented, it includes a fully functional 32-bit

graphical DOS interface.

If your hard disk is nearing its capacity, shrinking a partition with PartitionMagic can free up space on the disk.

With PartitionMagic, we tried out new file systems, adjusted the size of existing partitions, and were able to split large partitions into smaller ones without causing irreparable harm.

PartitionMagic is definitely a power user's tool, but it's the only tool that can resize partitions non-destructively.

PartitionMagic for DOS and OS/2, Version 1.02. List price: \$69. Requires: 4MB RAM, 3MB hard disk space, DOS 5.0 or later or OS/2 2.1 or later. PowerQuest Corp., Orem, UT; 800-379-2566, 801-226-8977; <http://www.powerquest.com>.

Circle 405 on reader service card

A u g u s t 2 4 t h w i l l n o l o n g
t h e f i r s t h u m a n c l e a r e d s e v e n

er be remembered as the date
teen feet in the pole vault.

CD-ROMs

Americana and Britannica: Adult Encyclopedias at Grown-Up Prices

By Rubin Rabinovitz

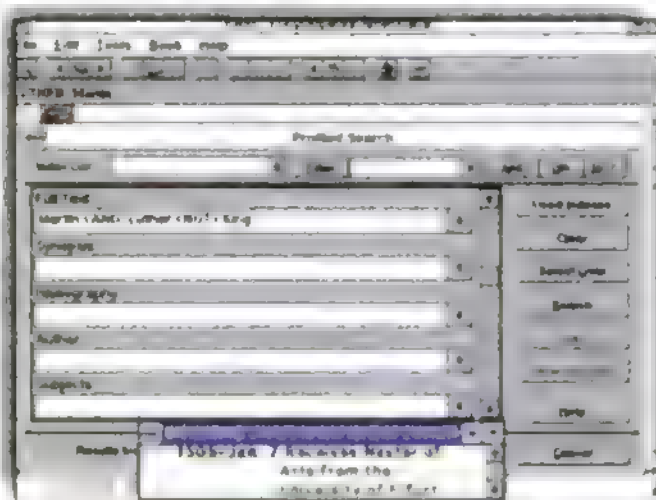
If you own an electronic encyclopedia, chances are you bought it for your kids. Two new CD-ROMs, Encyclopedia Americana (\$595) and Britannica CD (\$799), are targeted at adults. Both have excellent text databases and lack the multimedia goodies (videos, animations, slide shows, maps, and sound clips) that kids love and many adults can live without.

The new encyclopedias don't even have photographs: Americana comes with 1,200 line drawings, and Britannica has no graphics at all. Americana offers more tables, fact boxes, bibliographies, and special characters for mathematical, chemical, and musical notation than Britannica. But Britannica, which includes a dictionary and the full text of the print version, has the largest database of any electronic encyclopedia: 65,000 articles and 44 million words. The Americana database (which similarly gives the entire text of the print version) has 45,000 articles and 25 million words. By way of comparison, The Grolier Multimedia Encyclopedia has 33,000 articles and 10 million words.

Britannica's search engine is underwhelming: It's like having an outboard motor on a 100-foot yacht. It doesn't support wildcard searches, use date ranges, or locate numerical characters. The search engine also lacks the NOT Boolean operator: "Martin (AND) Luther" will work, but "Martin (AND) Luther (NOT) King" won't. Graphics images and an improved search engine will be added to Britannica's next version, due later this year.

Americana's search engine has all the amenities that Britannica's lacks, as well as a set of filters for restricting your search to article titles, article subsections, synopses of articles, bibliographies, contributors, subject areas, and geographical names. Moreover, the filters can be used alone or in

combination. Americana is also good at word-proximity searches. Americana can run on DOS,



WHAT NOT TO LOOK FOR: Encyclopedia Americana's search engine has the Boolean NOT operator.

Windows, and Mac platforms. It has a utility for creating and saving notes and lets you print its articles, but it can't display two or more articles simultaneously.

At a time when popular multimedia encyclopedias are selling for under \$100, Americana and Britannica carry hefty price tags. Both are authoritative, no-frills reference works that are more suitable for libraries, newspapers, law firms, and advertising agencies than for use at home. If you want to save money, get Americana; if price is no object, wait for Version 2.0 of Britannica. **Encyclopedia Americana.** List price: Single user, \$595. Requires: 4MB RAM, 4MB hard disk space, DOS 5.0 or later, Microsoft Windows 3.1 or



ALL WORDS: Britannica CD has 65,000 articles and 44 million words but no pictures.

later, CD-ROM drive. Grolier Electronic Publishing, Danbury, CT; 800-285-4534, 203-797-3530; fax, 203-797-3130.

Circle 414 on reader service card **Britannica CD (Version 1.0).** List price: Single user, \$799. Requires: 4MB RAM, 5MB hard disk space, Microsoft Windows 3.1 or later, CD-ROM drive. Encyclopaedia Britannica Inc., Chicago, IL; 800-323-1229, 312-347-7005.

Circle 415 on reader service card

WINDOWS SOFTWARE

Advanced Turbo Browser Displays Files One Drive at a Time

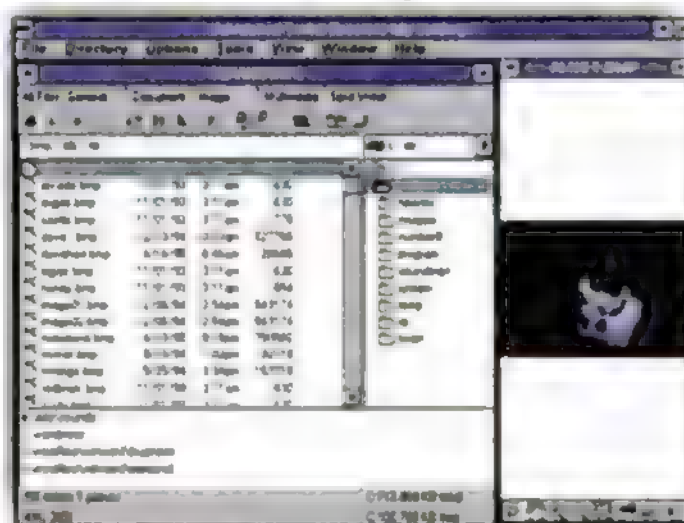
By David Haskin

Pacific Gold Coast Corp.'s \$89.95 Advanced Turbo Browser 4.0 is a flexible replacement for one of Microsoft Windows' weakest parts—File Manager. Turbo Browser provides powerful tools for searching through and viewing the most common file formats (graphics and video files included), but the program can't read from more than one drive at a time.

Like File Manager, Advanced Turbo Browser has one window displaying directories and another showing files within a selected directory. Above those windows are tabs containing different file specifications; select a specification and Turbo Browser displays only those files.

Another way to keep related files together is to drag them to user-definable folders. Once in a folder, files can have descriptive names as long as 255 characters. Yet another way to speed access

to commonly used data is to drag a directory to the shortcut list just below the directory and file windows. Once the directory is in the shortcut list, you can access it by double-clicking on it.



HIDE AND SEEK: Turbo Browser includes tabs containing customized file specifications for viewing just the files you want.

Turbo Browser can search for files by name, attribute, and content. But Turbo Browser leads its competitors by offering fuzzy searches.

The program lets you view the file contents of word processors and spreadsheets, but its strength lies in its ability to display 18 graphics formats and play all common video, animation, and audio

formats. It can handle as many as 25 viewing windows at a time; buttons on the bottom of each viewer simplify tasks like rotating images, viewing the next file, and zooming in and out.

Unlike File Manager and most other aftermarket replacements, Turbo Browser can't view multiple drives at the same time. To view multiple drives, you must launch Turbo Browser multiple times. This is a significant inconvenience. Most PC users frequently access files from at least three local drives (hard disk, floppy disk drive, and CD-ROM drive), and in business environments from many network drives. Launching a session of Turbo Browser for each drive takes time and eats up system resources.

If you plan to upgrade to Windows 95 in the near future, spending \$89.95 for Turbo Browser is pointless. But if you're staying with Windows 3.x and need powerful search and viewing abilities, Turbo Browser is worth a look, especially if you don't need to access multiple drives.

Advanced Turbo Browser 4.0. List price: \$89.95. Requires: 4MB RAM, 3MB hard disk space, Microsoft Windows 3.1 or later. Pacific Gold Coast Corp., Glen Cove, NY; 800-732-3002, 516-759-3011; fax, 516-759-3014.

Circle 413 on reader service card

STATISTICA

STATISTICA® (for Windows) • A complete data analysis system with thousands of on-screen customizable, presentation-quality graphs fully integrated with all procedures • Comprehensive *Windows®* support, OLE (client and server), DDE, customizable *Auto Task* toolbars, pop-up menus • Multiple data-, results-, and graph-windows with *data-graph* links • The largest selection of statistics and graphs in a single system; comprehensive implementations of: Exploratory techniques with advanced brushing; multi-way tables with banners (presentation-quality reports); nonparametrics; distribution fitting; multiple regression; general nonlinear estimation; stepwise logit/probit; general ANCOVA/MANCOVA; stepwise discriminant analysis; log-linear analysis; confirmatory/ exploratory factor analysis; cluster analysis; multidimensional scaling; canonical correlation; item analysis/reliability; survival analysis; a large selection of time series modeling/forecasting techniques; structural equation modeling with *Monte Carlo* simulations; and much more • On-line *Electronic Manual* with comprehensive introductions to each procedure and examples • Hypertext-based Stats Advisor expert system • Workbooks with multiple *AutoOpen* documents (e.g., graphs, reports) • Extensive data management facilities (fast spreadsheet of unlimited capacity with long formulas, *Drag-and-Drop*, *AutoFill*, *Auto-Recalculate*, split-screen/variable-speed scrolling, advanced Clipboard support, DDE links, hot links to graphs, relational merge, data verification/cleaning) • Powerful *STATISTICA BASIC* language with matrix operations, full graphics support, and interface to external programs (*DLLs*) • Batch command language and editable macros, flexible "turn-key" and automation options, custom-designed procedures can be added to floating *Auto Task* toolbars • All output displayed in *Scrollsheets®* (dynamic, customizable, presentation-quality tables with instant 2D, 3D, and multiple graphs) or word processor-style report editor (of unlimited capacity) that combines text and graphs • Extremely large analysis designs (e.g., correlation matrices up to 32,000x32,000, unlimited ANOVA designs) • Megafile Manager with up to 32,000 variables (8 Mb) per record • Unlimited size of files; extended ("quadruple") precision; unmatched speed • Exchanges data and graphs with other applications via DDE, OLE, or an extensive selection of file import/export facilities (incl. *ODBC* access to virtually all data bases and mainframe files) • Hundreds of types of graphs, incl. categorized multiple 2D and 3D graphs, ternary 2D/3D graphs, matrix plots, icons, and unique multivariate (e.g., 4D) graphs • Facilities to custom-design new graph types and add them permanently to menus or toolbars • On-screen graph customization with advanced drawing tools (e.g., scrolling and editing of complex objects in 32x real zoom mode), compound (nested) OLE documents, *Multiple-Graph AutoLayout Wizard*, templates, special effects, icons, page layout control for slides and print-outs; unmatched speed of graph redraw • Interactive rotation, perspective and cross-sections of 3D displays • Large selection of tools for graphical exploration of data: extensive brushing tools with animation, fitting, smoothing, overlaying, spectral planes, projections, layered compressions, marked subsets • Price **\$995**.

Quick STATISTICA (for Windows) • A subset of *STATISTICA*; comprehensive selection of basic statistics and the full analytic and presentation-quality graphics capabilities of *STATISTICA* • Price **\$495**.

STATISTICA/QC - Industrial statistics add-on package (requires *STATISTICA* or *Quick STATISTICA* for Windows) • The largest selection of industrial statistics in a single package; quality control charts (compatible with real-time data acquisition systems), process capability analysis, R&R, sampling plans, and an extremely comprehensive selection of experimental design (DOE) methods • Flexible tools to customize and automate all analyses and reports (incl. "turn-key" system options, and tools to add custom procedures) • Price **\$495**.

STATISTICA/Mac (for Macintosh) • Price **\$695** (Quick - \$395)

Domestic sh/h \$12 per product; 30-day money back guarantee.



StatSoft

2325 E. 13th St. • Tulsa, OK 74104 • (918) 583-4149
Fax: (918) 583-4376

CIRCLE 057 ON READER SERVICE CARD

Overseas Offices: StatSoft of Europe (Hamburg, FRG), ph: 040/4200347, fax: 040/4911310
StatSoft UK (London), ph: 0462/482822, fax: 0462/482855, StatSoft Pacific (Melbourne, Australia), ph: (03) 863 6580, fax: (03) 863 6117, StatSoft France ph: (1) 45 06 97 00, fax: (1) 45 66 06 51; Available from other Authorized Representatives worldwide. Sweden: AkademData Scientific ph: 018-210035, fax: 018-210036; Finland: Statsoft Oy ph: 24 334678, fax: 24-333867; Belgium: Teume NewTech ph: 10 61 16 28, fax: 10 61 69 57; South Africa: Osins ph: 12-663-4500 fax: 12-663-6114, Japan (Macintosh) Three's Company, Inc. ph: 03-3770-7600 fax: 03-3770-7784, Japan (Windows) Design Technologies, Inc., ph: 03-3667-1110, fax: 03-3668-3110; Italy: Prompt SRL ph: 49-893-3227 fax: 49-893-2897, Poland: Compcon Oprogramowanie ph: 12-369680 fax: 12-360791 Taiwan: Intelligent Integration Corp ph: 2-759-1791, fax: 2-750-1790. StatSoft, the StatSoft logo, STATISTICA, and Scrollsheet are trademarks of StatSoft, Inc.



CAD

You Control the Design with Chief Architect

By C. James Galley III

If remodeling a home or apartment is in your future, check out Advanced Relational Technologies' Chief Architect 3.0. The \$995 program is positioned between complex full-featured CAD packages and low-end hobbyist-type programs. Chief Architect targets both the serious home remodeler who's outgrown a low-end home improvement program and full-time construction professionals.

If you've used Broderbund's \$60 3D Home Architect, you should feel at home with Chief Architect.



OUR HOUSE: Chief Architect can combine different views of a plan.

since Advanced Relational Technologies created both programs. Chief Architect takes 3D Home Architect's intelligent object core to a new level by adding additional objects and advanced features.

Using Chief Architect is simple and straightforward. After the new walls are in place, one double-click of the mouse will automatically generate floors, ceilings, and roofs. This feature is absent on many CAD offerings.

Chief Architect isn't flawless.

We had problems placing doors through railings, and the bill of materials list that it creates can't be edited. The company says these problems are being addressed in an update.

Such glitches are minor in a package that offers so much design flexibility. For plumbers, builders, craftspeople, or home remodelers, nothing else comes close.

Chief Architect 3.0. List price: \$995. Requires: 8MB RAM, 8MB hard disk space, Microsoft Windows 3.1 or later. Advanced Relational Technology Inc., Coeur d'Alene, ID; 800-482-4433, 208-664-4204, fax 208-664-1316.

Circle 402 on reader service card

PRINTING HARDWARE

GoPrint: The Wireless Printing Connection

By Kathy Nathan Kendall

AeroComm's \$449 GoPrint wireless printing package lets you replace your PC's printer cable with a spread-spectrum radio system that's faster than the built-in infrared ports on notebooks and has a longer range.

The package consists of a 2.4-gigahertz transmitter (for the PC) and receiver (for the printer). Setup is quick and easy; just plug the units into the printer and the PC and run the configuration software.

We found printing to be reliable, but when the transmitter and receiver were within 4 feet of each other, transmission speed was erratic. As we moved the transmitter beyond 4 feet from the receiver, transmission time settled in at a consistent 6 seconds to print a two-page document using Microsoft Word. The system lost contact when the transmitter and receiver were about 300 feet apart.

GoPrint is significantly faster and has a range that is more than ten times greater than that of infrared (IR) wireless printing with either HP's LaserJet 5 series or an add-on IR device. And unlike IR, GoPrint doesn't require a line-of-sight connection between PC and printer to work.

GoPrint is a multiuser printing solution that can connect several PCs to a single printer.

Each workstation can have access to up to eight different printers, and each printer can handle simultaneous print requests from multiple sources. GoPrint's communication is one-way, however, and can't use the abilities of a PC's bidirectional printer port to report printer status.

At \$449, GoPrint is an expensive replacement for a \$10 parallel

cable, but it's one that can free you from the constraints of being cable-bound. Mobile computing takes on a new meaning as printing becomes accessible from offices, cubicles, and conference rooms throughout the office.

GoPrint. List price: \$449. Requires: Parallel port, printer. AeroComm Inc., Lenexa, KS;



POINT AND PRINT: GoPrint uses spread-spectrum technology to connect PCs to a printer.

913-492-2320; fax, 913-492-1243.

Circle 401 on reader service card

WINDOWS AUTOMATION

ClickFlick Produces Instant Menus, Anywhere

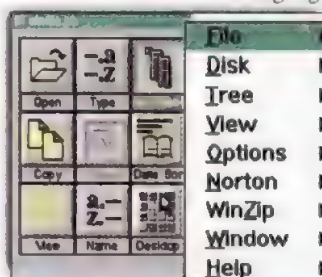
By Barry Simon

MiraTech's \$90 ClickFlick is an impressive automation/customization utility that pops up an application-specific toolbox on a specified mouse click, comes with support for 12 popular applications, and includes a scripting language.

With ClickFlick, an application can have multiple pop-up boxes, which are triggered by distinct mouse clicks or keystrokes. That's the Click part. The Flick part happens when you quickly press one of the buttons of the pop-up box. Actions assigned to buttons can include any menu choice in the application or even the application's entire menu structure, so you don't have to drag the mouse up to your application's menu bar.

You can also assign a script to a

button written in a Visual Basic-compatible language that includes high-end functions such as DDE and MCI. This language



FINGERTIP CONTROL: ClickFlick's pop-up boxes let you place a menu anywhere on-screen.

comes from the same company that provides the scripting language behind Norton Desktop's automation tools. You can record a set of actions to a script, design dialog boxes in a dialog editor,

and trace through a complex script in the program's debug mode.

While the power is there if you need it, the default toolboxes are extremely useful and adding menu items is easy. We experienced a few bugs and crashes while testing ClickFlick that are indicative of this program's status as a first release; the vendor is working on fixing them.

Warts aside, ClickFlick allows you to instantly bring up a menu at the click of the mouse and put it anywhere on your screen.

ClickFlick 1.0. List price: \$89.95. Requires: 4MB hard disk space, Microsoft Windows 3.1 or later. MiraTech, Palo Alto, CA; 800-330-9816, 415-842-7133; fax, 415-842-7144.

Circle 410 on reader service card

Powerhouse performance with exceptional portability

HP OmniBook 600

- 3.8 pounds; 7.3" x 11.1" x 1.6"
- 75MHz IntelDX4™, 50MHz IntelDX2™ processors
- 8.5" DSTN VGA with 256 colors; simultaneous SVGA-out supports up to 1024 x 768 x 256 colors
- Accelerated local-bus video
- Full-sized, 85-key touch-typeable keyboard; built-in, pop-up mouse
- Typical battery life 3.5 hours (*PC Magazine* run down test 2.46 hours**)
- 260MB or 170MB rugged, removable PCMCIA hard drive
- 4/8MB standard RAM, expandable to 12/16MB
- Two PCMCIA Type II slots (or one PCMCIA Type III)
- External floppy drive comes standard
- Built-in I/O (serial, parallel, infrared, VGA out)
- Optional enhanced port replicator that adds SCSI-2 and HP LAN card slot
- Instant on/off; hot keys for faster application access
- EPA Energy Star certified
- Three-year limited warranty, first-year overnight Express Exchange

from

\$2,450*

Bold, dazzling color and stereo sound in an easily portable package

HP OmniBook 4000

- 100MHz IntelDX4, 50MHz IntelDX2 processors
- 10.4" TFT (supporting up to 64K colors) or 10.3" DSTN display
- Accelerated local-bus video
- 16-bit Sound Blaster-compatible stereo sound including two built-in stereo speakers
- 4/8MB standard RAM, expandable to 32MB
- Up to 520MB hard disk drive
- Type III PCMCIA card slot (or use as two Type II slots)
- Optional second battery can substitute for floppy disk drive
- Optional enhanced port replicator adds SCSI-2, PCMCIA slots, and MIDI/joystick port
- Built-in infrared port
- Built-in I/O (serial, parallel, SVGA, audio, and keyboard/mouse ports)
- EPA Energy Star certified
- Three-year limited warranty, first-year overnight Express Exchange

from

\$2,399*

Two great road shows.

When it's time to get your show on the road, take along a great performer that carries its own weight. Like an HP OmniBook notebook PC.



For rich, vibrant color plus full stereo sound in an easily portable package, there's nothing like the HP OmniBook 4000 for impactful presentations. Then there's the winner of this year's *PC Magazine* Editors' Choice Award, the HP OmniBook 600. At just 3.8 pounds, it packs all the performance you need into one slim package.

All of which makes them both the perfect balance of power and pounds. For more information on HP OmniBook notebook PCs, call us today at 1-800-443-1254, Ext. 366. Like any good supporting act, they'll help your star shine even brighter.



**HEWLETT
PACKARD**



†In Canada, call 1-800-387-3867. *Average U.S. street price. **PC Magazine labs WINDrawn 1/95. MS-DOS is a U.S. registered trademark and Windows is a U.S. trademark of Microsoft Corporation. The Intel Inside logo is a U.S. registered trademark of Intel Corporation. ©1995 Hewlett-Packard Company. PPG415

Pentium® processor power
at an entry-level price.

HP Vectra VE

- Intel 75 and 90MHz Pentium processors
- Optional 256KB second level cache
- 270MB,* 14-ms high-performance Enhanced-IDE hard drive
- Local bus Enhanced-IDE hard disk interface
- Four mass storage shelves, four expansion slots
- PCI, ISA bus architecture
- 8MB RAM, expandable to 128MB
- PCI integrated 32-bit Cirrus Logic 3430 graphics accelerator supporting up to 1024 x 768 resolution
- 1MB of video RAM standard
- Flash BIOS for easy upgrade
- Full plug-and-play capability
- Complete Windows 95 compatibility
- Preloaded Desktop Management Interface (DMI)
- EPA Energy Star certified
- Free three-year limited warranty for parts and labor²

from
\$1,639*



Leading Pentium processor/PCI
performance at an affordable price.

HP Vectra VL3

- Intel 75, 90, 100 and 120MHz Pentium processors
- Standard 256KB second level cache
- 420MB,** 11-ms ultra high-performance Enhanced-IDE hard drive
- Local bus Enhanced-IDE hard disk interface
- Four mass storage shelves, four expansion slots
- PCI, ISA bus architecture
- Two available 32-bit PCI slots
- 8MB RAM, expandable to 192MB
- PCI integrated 64-bit Cirrus Logic 5434 graphics accelerator supporting up to 1280 x 1024 resolution
- 1MB of video RAM standard, expandable to 2MB
- Flash BIOS for easy upgrade
- Full plug-and-play capability
- Complete Windows 95 compatibility
- Preloaded Desktop Management Interface (DMI)
- EPA Energy Star certified
- Free three-year limited warranty for parts and labor²

from
\$1,799*



Redefining network-ready PCs
for the workgroup.

HP Vectra XM3

- Intel 75, 90 and 120MHz Pentium processors
- Leading Remote Management (HP DMI250) preinstalled
- PCI integrated 32-bit 10baseT Ethernet interface
- Network certified and preconfigured for Microsoft and Novell clients
- Parallel Transfer Driver pre-installed for faster LAN packet processing
- Standard 256KB second level cache
- 64-bit graphics accelerator (Cirrus Logic 5434) on PCI bus
- 1MB of video RAM standard, expandable to 2MB
- 8MB RAM, expandable to 192MB
- Enhanced-IDE controller on PCI bus
- 420MB,** high-performance Enhanced-IDE hard drive
- Four mass storage shelves (three front accessible), four expansion slots
- Two 32-bit PCI slots
- Flash BIOS for easy upgrade
- Complete Windows 95 compatibility
- Free three-year limited warranty for parts and labor²

from
\$1,859*
new



*In Canada, call 1-800-387-3867. **Average U.S. street price. Monitor not included. Source: 1994 ID Power and Associates Desktop PC Customer Satisfaction Study. **Study conducted among business Second and third year, return to dealer. MS DOS is a U.S. registered trademark and Windows is a U.S. trademark of Microsoft Corporation. Pentium and the Intel Inside logo are U.S. registered

The ultimate PC for advanced business and technical applications.

HP Vectra XU

- Intel 75 and 90MHz Pentium processors
- Supports dual processing with secondary processor socket
- 256 or 512KB second level asynchronous or burst synchronous write-back cache
- PCI architecture
- Four mass storage shelves (three front accessible), five expansion slots
- Two 32-bit PCI slots
- 540MB,** high-performance Enhanced-IDE hard drive
- Integrated 32-bit PCI Fast SCSI-2 and Enhanced-IDE interfaces
- Integrated 64-bit PCI, S3 Vision-964 graphics with 1280 x 1024 resolution or Matrox Impression Plus graphics with up to 1600 x 1200 resolution
- 8 or 16MB of RAM standard, expandable to 256MB
- Integrated PCI 32-bit 10BaseT and Coax network interface
- Preloaded Desktop Management Interface (DMI)
- Free three-year limited warranty for parts and labor²

from

\$2,529*



Three years after we introduced network-ready HP PCs, Compaq is touting theirs. Wonder when they'll highlight their prices.

You may also wonder what Compaq means by 'network-ready.' For instance, are their PCs easiest to set up in multivendor networks? Is their management solution industry-standard – and can it manage all brands of PCs, not just their own? Are all management features available under Windows 3.1? Are they free? In HP's case, the answers are all yes.

In addition, HP ranked best overall among desktop PC business users in the 1994 J.D. Power and Associates Customer Satisfaction Study.¹

So why wait? Call 1-800-322-HP-PC, Ext. 9385,* for more information or the name of your nearest HP reseller. We're more network-ready than anyone.



**HEWLETT
PACKARD**

*Users and based on 1,526 user respondents. **Other capacities available. Ad HP Vectra PC's come with MS DOS[®] v2 and MS Windows for Workgroups 3.11 preinstalled. HP mouse and keyboard. First year on-site 24-hour service. trademarks of Intel Corporation, ©1995 Hewlett-Packard Company. PPG422



Our New Models Have Incredible Features And Stunning Figures.

Introducing Our New Series Of Monitors.



With all the right features, plus figures that fit your budget, it's no wonder our new V-Series of 14" and 15" monitors is getting the spotlight. Which it should, given the stylish, well-rounded design that's easy on the eyes and great-looking on your desk.

But more than just another pretty face, our monitors are also sophisticated. Including microprocessor intelligence. Fingertip front-panel controls. 76Hz flicker-free refresh rates. And brilliant, non-interlaced images.

That's because each is from ADI—a world leader that's put over four million OEM monitors on the market in the last two years. Which means, for a great price, you get the quality and performance of a much more expensive monitor. Plus you get reliability. For proof, just look to our ISO-9001 rating. And our own manufacturing process that allows complete control over quality. Which is why we can offer a two-year warranty.

So phone us today. See why you can't afford to let these great models pass you by. For more information on ADI, our monitors and the ADI Authorized Reseller/Demo Program, call 1-800-228-0530. For automated faxed product information and editorial reviews, call 1-800-767-8182

The ADI V Series Family		
	MICROSCAN 3V	MICROSCAN 4V
Ideal For:	Everyday business graphics, general business computing and Windows™ applications	General business computing, graphic user interfaces, desktop publishing and Windows applications
Picture Tube:	14" (0.28)mm	15" (0.28)mm
Resolution:	1024 x 768 @ 60Hz	1280 x 1024 @ 60Hz
Video/H-sync Bandwidth:	30-50kHz	30-64kHz
Front Panel Controls:	Digital	Digital



CIRCLE 226 ON READER SERVICE CARD

ADI

Any way you look at it.

ADI Systems, Inc. 2115 Ringwood Avenue, San Jose, CA 95131

MicroScan is a trademark of ADI Systems, Inc. All other brands or product names are trademarks or registered trademarks of their respective companies. The Energy Star emblem does not represent EPA endorsement of any product or service. © 1995 ADI Systems, Inc. All rights reserved.

New & Improved

NEWS OF ANNOUNCED PRODUCTS AND UPGRADES

By Asa Somers

Finally, Multimedia Apps Speak for Themselves

What with all the fuss about video and animation, the integration of voice is an oft-forgotten element in the development of multimedia applications. The \$895 ToolVox developers' kit from **VoxWare**, which comprises four voice-processing utilities, should change that.

ToolVox's Compressor utility achieves voice file-compression ratios of 25:1 to 35:1, allowing you to store an hour of speech (sampled at 11 kHz) in a mere 3MB of disk space. You can make a child's voice sound like an adult's or a female voice sound male with Perfect-Pitch, which lets you shift a voice's pitch by up to two octaves. Furthermore, Warp-It lets you accelerate or decelerate voice files by up to a factor of five while maintaining the original voice quality.

Perhaps the most intriguing part of ToolVox is Morph-It. This utility makes it possible to alter the resonance and timbre—basically the character—of a voice, creating VoiceFonts that can be saved and applied to subsequent vocal samples.

ToolVox. List price: With 5,000-copy distribution license, \$895. VoxWare Inc., Skillman, NJ; 609-497-1212; fax, 609-497-2490; e-mail, vox@voxware.com.

Circle 417 on reader service card

Audio Without the Clicks

Futuretouch Corp.'s Multimedia Soundpad gives you immediate push-button control of audio mixing and the volume of your CD-ROM player, saving you a passel of annoying mouse clicks. The \$39.95 Soundpad looks like a small TV remote control and plugs into the serial port of your multimedia PC. Its 21 buttons give you all the controls of a standard CD player and let you mix .WAV and MIDI files and microphone, CD, and auxiliary input.

Multimedia Soundpad. List price: \$39.95. Futuretouch Corp., Santa Ana, CA; 714-558-6824; fax, 714-558-4889.

Circle 418 on reader service card

Photography by Thom O'Connor



PageMaker Turns Ten, A More Professional DTP Tool

This year marks the tenth birthday of PageMaker, and to celebrate, **Adobe Systems** has introduced a new version of the product. Targeted at high-end and mainstream users alike, the \$895 PageMaker 6.0 features major improvements in color publishing and prepress controls.

The most impressive of Version 6.0's enhancements is its wealth of professional color-publishing capabilities, including support for the Kodak Precision color-management system and for HiFi, Pantone Hexachrome, and LAB color technologies. You can now edit PhotoCD images when you import them and manage their color directly inside PageMaker. This version also supports expanded Pantone libraries, including metallic and fluorescent inks, and lets you remove unused colors from your Color Palette.

Adobe has augmented PageMaker's prepress capabilities with one-click printing of readers' spreads, support for non-printing objects, service-bureau output options, and support for transparent backgrounds in imported TIFF files. Another major enhancement is Version 6.0's sophisticated automatic trapping support.

PageMaker 6.0 also offers some new mainstream features that were conspicuously absent in earlier versions and that users of rival QuarkXPress have taken for granted for a while. These include Bring Forward and Send Backward commands and the grouping and ungrouping of objects (although designers will still pine for nested grouping capabilities).

PageMaker 6.0. List price: \$895; upgrade from Version 5.0, \$150. Adobe Systems Inc., Mountain View, CA; 800-628-2320.

Circle 416 on reader service card

HP Vectras Have DMI for Remote Configuration

The new HP Vectra XM Series 3, Pentium-based PCs from **Hewlett-Packard Co.**, include Desktop Management Interface (DMI)-compliant features that let network administrators configure



CALLING ALL VECTRAS: These DMI-compliant machines can be managed from afar.

client PCs remotely over a LAN. Each Vectra comes equipped with either a 75-, 90-, or 120-MHz Pentium processor, 8MB of RAM (upgradable to 192MB), and either a 420MB or 840MB Enhanced IDE hard disk. The Vectras also include built-in 32-bit Ethernet chips.

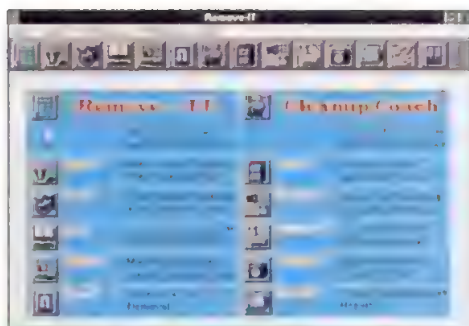
Via network management software, administrators can acquire information about each Vectra on the network and set its parameters. The Vectras also offer advanced security features, including two-level password protection, the storage of configurations and passwords in nonerasable EPROM, and a button for locking the keyboard and mouse on the machine's front panel.

HP Vectra XM Series 3. List price: Basic configuration (no monitor), \$1,500. Hewlett-Packard Co., Palo Alto, CA; 800-752-0900; fax, 800-333-1917. Circle 419 on reader service card

Remove-IT Has Windows 95 Upgrade Help to Boot

Remove-IT 2, the latest version of the file-removal utility from **Vertisoft Systems**, has a number of powerful new features, perhaps the most important of which is the Windows 95 Upgrade Assistant. In a dual-boot configuration, the Assistant automatically installs Windows 3.x applications into Windows 95; in a single-boot installa-

New & Improved



THE PATH OF LEAST RESISTANCE: Remove-IT 2 removes Windows 95 upgrade obstacles.

tion, it removes unneeded Windows 3.x remnants. The new Installation Knowledge-Base helps you remove existing apps with its encyclopedia of over 850 application installation routines. You can now remove files from network drives, and the Transfer-IT feature creates a self-installing backup so you can move apps or files between computers. **Remove-IT 2.** Estimated street price: \$39.95. VeriSoft Systems Inc., San Francisco, CA; 800-466-5875; fax, 800-466-4719.

Circle 424 on reader service card

Lean Storage Machine

The removable storage market just got another kick in the pants, this time from **Iomega Corp.**'s new Jaz drive. Designed for high-end SOHO and multimedia users, the 2-pound Jaz drive—expected to sell on the street for less than \$500—uses 3.5-inch 540MB (\$69) or 1GB (\$99) hard disk cartridges and provides a claimed transfer rate of 6.7 MBps. The Jaz features a 256K read/write cache and delivers a 17.5-ms average access time.

Jaz. Estimated street price: \$499. Iomega Corp., Roy, UT; 800-697-8833.

Circle 420 on reader service card

LiveShare Plus Makes Computing Collaborative

PictureTel Corp.'s LiveShare Plus provides a number of shared-computing capabilities via a modem or LAN, including application sharing, remote control, and whiteboard and messaging features.

Two users can work together on any Windows application in real time, even if only one of them has that program. LiveShare allows a remote user to take control of another PC over standard phone lines. You can access data from a home PC or troubleshoot problems on a remote computer. LiveShare's whiteboard capabilities let both parties to a conference highlight, draw, and import graphics via any application that prints.

LiveShare Plus. List price: \$249. PictureTel Corp., Danvers, MA; 508-762-5000; fax, 508-762-5245.

Circle 426 on reader service card

HARDWARE BRIEFS

Acer America Corp. has announced the AcerNote Pro and AcerNote Light notebook computers. The \$2,999 Pro features a 75-MHz Pentium processor, 8MB of RAM (upgradable to 40MB), and a 10.4-inch active-matrix screen. The \$2,399 Light comes with a DX4/75 processor, 8MB of RAM, and either a 10.2-inch TFT or 10.4-inch dual-scan display. 800-368-2237.

Entry-level CD-ROM developers are the target of **Smart and Friendly's** new CD-R 1002 Series of dual-speed CD-ROM recorders. Starting at \$1,729, the 1002s come in three configurations, each with a different bundle of developers' software. 818-994-8001.

The \$8,495 LaserPress 1800 from **Xanté Corp.** is a true 1,800- by 1,800-dpi laser printer that features a 33-MHz AMD 29030 RISC processor and 48MB of RAM (upgradable to 128MB). It handles pages up to 12 by 19 inches and comes with a 250-sheet universal cassette and a multipurpose feeder. It has simultaneously active serial, parallel, and LocalTalk interfaces; Ethernet is provided as an option. 334-476-8189.

Directed primarily at SOHO users, the new StudioScan IIs color flatbed scanner from **Agfa** should sell on the street for under \$1,000. The model does 400- by 800-dpi scanning and comes with FotoSnap scanning software, the Adobe PhotoShop LE photo-editing package, and Omnipage for optical character recognition. 201-440-2500.

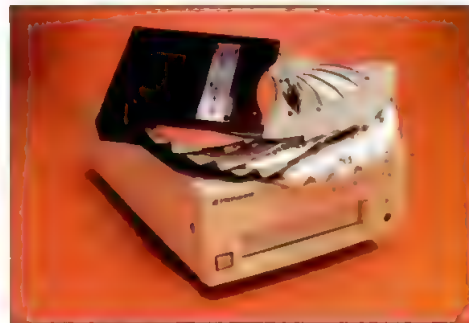
Dukane Corp. has entered the LCD panel market with its three MagniView models: the \$3,995 text-only MagniView 486, the \$4,595 487, and the \$4,995 488B. The company has also introduced three new ImagePro LCD projectors: the \$7,995 8000, the \$8,995 8010, and the \$9,495 7010. 708-584-2300.

Dycam has introduced the Dycam Model 10-C Color Digital Camera, designed specifically for documentation. The 10-C provides 640-by-480 resolution and comes with a power zoom lens. Expected to sell for under \$1,000, the camera has only 1MB of resident memory (enough to store four pictures), but you can purchase removable memory cards to expand your storage space. 800-883-9226.

Eminent Technology is shipping the LFT-11 high-end planar magnetic multimedia speaker system. The \$899 set includes two 3/4-inch-thick desktop speakers and a separate cabinet containing two 5.5-inch woofers. 904-575-5655.

CD-ROM: Pioneer Rolls Out a Quick Six-Shooter

Now shipping from **Pioneer New Media Technologies** is a six-disk CD-ROM drive that operates at what the company calls 4.4X speed—the Pioneer DRM-624X. The 624X's magazine holds six disks upside down to prevent dust collection; it can



A FAST SIX-PACK: Pioneer's multidisk CD-ROM drive operates at 4.4X speeds.

switch between any two disks in 5 seconds or less. The \$795 drive performs at better-than-4X speed, achieving a maximum data-transfer rate of 676 KBps and an average access time of 150 milliseconds, according to the company.

Pioneer DRM-624X. List price: \$795. Pioneer New Media Technologies Inc., Long Beach, CA; 800-222-6784, 310-952-2111; fax, 310-952-2990.

Circle 422 on reader service card

ThinFax: Dual Functions For Your HP Palmtop

EXP Memory is shipping the ThinFax 1414LXM specifically for use with HP 100LX and 200LX palmtop computers. This dual-function PC Card Type II device combines a 14.4-Kbps fax/modem and either 2MB or 4MB of flash memory. You can instantly store faxes in the 1414LXM's memory as they are received. The company is also offering the \$299 ThinFax 1414LX, which offers only fax/modem capabilities without the memory.

Both the 1414LX and 1414LXM come with EXP's Minifax communications software, designed for use with the HP 100/200LX family of palmtop computers.

ThinFax 1414LXM. List price: With 2MB of flash memory, \$399; with 4MB, \$499. EXP Memory Inc., Irvine, CA; 714-453-1020; fax, 714-453-1319.

Circle 421 on reader service card



FAX-'N'-SAVE: The ThinFax features either 2MB or 4MB of flash memory.

Celebrating our 10th Anniversary!

The Foundation for a Perfect PC.

POWER SUPPLIES

"The premier power-supply maker"

John Dvorak, *PC Magazine*, March 30, 1993

"The only company to go to for a power supply"

Jerry Pournelle, *Byte*, April 1993

ENERGY-SAVING UNITS

Save juice with efficient, economical Star power supplies. Fully-tested, UL/CSA/TUV approved.
STAR 205 SLIM/DESK/TOWER\$79

ULTRA-QUIET UNITS

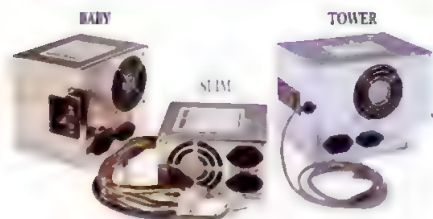
NOISE LEVEL (dB)



Unrattle your nerves with an ultra-quiet **Silencer®** power supply. Appreciated by users since 1986, their high-efficiency fans and low-turbulence circuitry reduce noise by up to 84%! A *multimedia* must!

SILENCER 205 SLIM\$99
SILENCER 270 SLIM\$149
SILENCER 270 DESK/TOWER\$169

HIGH-PERFORMANCE UNITS



For power that won't skip a beat during hard drive access or line voltage sags, upgrade your PC with a premium **Turbo-Cool®** power supply. You'll get 50%-100% more power, built-in line conditioning, super-tight regulation, ultra-clean output, enhanced cooling, UL/CSA/TUV, and 3-5 year warranty! Why run a high-end system with anything less?

TURBO-COOL 250 3.3V SLIM\$149
TURBO-COOL 300 SLIM/BABY\$149
TURBO-COOL 300 DESK/TOWER\$179
TURBO-COOL 400 SLIM/TOWER\$219
TURBO-COOL 450 DESK/TOWER ...\$329
TURBO-COOL 450 3.3V TOWER\$379

MINI-TOWER CASES

"The only worthy upgrade [cases] I've found"

Ed Bott, *PC Computing*, October 1994



For a clean, easy-to-build system, there's nothing else like our economical **Personal Mini-Tower** enclosure. Features: small footprint, (3) 5-1/4" bays, (4) 3-1/2" bays (2 int.), a removable motherboard cage for easy assembly.

Specs: FCC-B, 16.7"D x 7.2"W x 15.5"H, 16lbs.
PERSONAL MINI-TOWER\$79



For a great-looking, heavy-duty, **USA-made** enclosure, choose our new **Solid-Steel Mini-Tower**. Features: (3) 5-1/4" bays, (3) 3-1/2" bays (2 int.), accepts a baby or full-size motherboard, assembles with removable drive cage.

Specs: FCC-B, 16.2"D x 8.5"W x 15.4"H, 23lbs.
SOLID-STEEL MINI-TOWER\$189

REDUNDANT POWER

Eliminate the risk of network downtime or data loss due to power supply failure with the **TwinPower 900** redundant power system. It delivers high-capacity, fault-tolerant power to your entire network server. Consists of 2 **Turbo-Cool 450** power supplies in parallel and a special power interface module. A must for *mission critical* LANs.

- 900 watts peak power
- 5,000,000 Hr MTBF
- load-sharing design
- remote-sense feature
- hot-swap capability

TWIN-POWER 600\$695
TWIN-POWER 900\$995
OPTIONAL 600 TOWER CASE\$295
OPTIONAL MONSTERCASE\$795

*Solid-Steel
Monster Case
holds 2 MBs
& 18 drives.*



Rear View

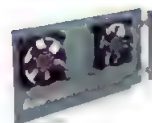
CPU COOLERS



486s and Pentiums run hot, often exceeding 185°F! Cool 'em by 70°-100°F with genuine, low-profile **CPU-Cool** coolers. Each consists of a long-life, ball-bearing, mini-fan *integrated* into a patented die-cast heat sink that easily mounts on the CPU. Powered by a spare drive plug. Last 10X longer and are 40% thinner than cheap, bulky imitations! **CPU-COOL 1.9" (486s, 90/100 Pentiums) .. \$24**
CPU-COOL 2.3" (60/66 Pentiums) \$29

CARD COOLER

Slide our handy dual-fan **Buss-Cool** into a slot and keep hot cards and chips up to 40°F cooler!



BUSS-COOL\$34

OVER-TEMP ALARMS

Don't let PC fan failure cost you your system! Install our **110 TwinAlert** to detect overheating *before* damage occurs. At 110°F, you'll get a loud audible alarm and a signal for remote monitoring.

If the warning is ignored, and 118°F is reached, the **TwinAlert** saves your machine by *automatically* turning-off its power! This low-cost protection is compact, easy to install, and works in any computer.

110 ALERT (original heat alarm)\$24
110 TWINALERT (2-stage heat alarm)\$39
110 ALERT+ (heat & fan RPM alarm)\$39



PC POWER & COOLING, INC.

5995 Avenida Encinas, Carlsbad, CA 92008 • (619) 931-5700 • (800) 722-6555 • Fax (619) 931-6988

We accept Visa, MC, COD, or PO on approved credit. Warranty period: 5-years for CPU-Cool, Turbo-Cool 450/550, and TwinPower. 3-years for Turbo-Cool (except 450/550). 2-years for all others. Hours: 7 a.m. - 5 p.m. (PT) Mon. - Fri. Silencer, Turbo-Cool, TwinPower, CPU-Cool, and 110 Alert are trademarks or registered trademarks of PC Power & Cooling, Inc. ©1995 PC Power & Cooling, Inc. CIRCLE 080 ON READER SERVICE CARD

Your idea of an office has changed. Your idea of great color hasn't.

The
BJC-70
COLOR
BUBBLE JET
PRINTER

These days your office is likely to be wherever you happen to work. The bedroom. The boardroom. The backyard. And that work better be spectacular. So your

printer has to go everywhere you do, producing brilliant color and true black out-

put that's absolutely

top drawer.

That's the beauty of the BJC-70 Color Bubble Jet™ Printer from Canon.

First, you get 720 x 360 dpi resolution (really crisp quality) and 4 page-per-minute laser speed in black and white. On top of that you get bright, vibrant colors.

All in one sleek, cool, economical little package.

But don't let the size fool you.

The BJC-70 auto-feeds 30 sheets at a time. And it's so rugged we offer a two-year limited warranty including free InstantExchange.

Naturally, it's as easy to use as it is to carry.

It even comes with our Color Advisor software that automatically picks the colors that make you look your best.

So give us a call at 1-800-848-4123, Ext. 111.

Because the BJC-70 Color Printer is going to be giving you all kinds of new ideas.



Work here.

Work anywhere.



Feeds 30 sheets automatically.

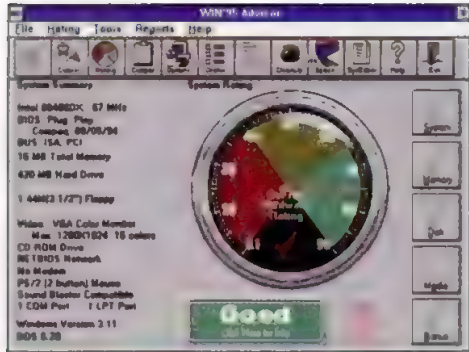


Sharp, fast, brilliant colors and true blacks.

Canon

Windows 95 Migration: Here's a Helping Hand

When Windows 95 ships later this summer, you can bet some phones in Redmond will be ringing off the hook: installation troubles, compatibility issues, hardware problems. You can save yourself some time and hassle—and some hefty phone charges—



MIGRATION WITHOUT THE MIGRAINE: WIN'95 Advisor makes your system Windows 95-compatible.

with WIN'95 Advisor from **TouchStone Software Corp.** This utility evaluates your Windows 3.x system's current configuration, determines what you still need in order to migrate to Windows 95, and then assists you in preparing for the installation. Advisor makes sure your hardware and software are compatible with Windows 95, helps you plan space for your migration, and sweeps your hard disk of unnecessary files. It can also set up a batch file that performs the installation automatically and reduces the number of manual steps you must take. **WIN'95 Advisor.** Estimated street price: \$39.95. **TouchStone Software Corp.,** Huntington Beach, CA; 800-531-0450, 714-969-7746; fax, 714-969-1555. Circle 425 on reader service card

Encore 4.0 Hits the Notes

Version 4.0 of **Passport Designs'** powerful musical notation package, **Encore**, is now shipping—featuring a number of enhancements that will appeal to the hard-core musician in you. You can now customize the toolbar by adding commands from the pulldown menus. A new percussion utility lets you map complex drum parts to a staff, and you can zoom in on your notation at standard and user-definable magnification levels.

Passport has enhanced the product's guessing algorithms, which giving the user more control over triplets and quantization offsets. **Encore's** guitar tablature features have also been upgraded, supporting definable fretting positions, and **Encore** now offers on-line help.

Encore, Version 4.0. List price: \$595; upgrade, \$69. **Passport Designs, Half Moon Bay, CA;** 415-726-0280; fax, 415-726-2254.

Circle 423 on reader service card

SOFTWARE BRIEFS

Timeslips Corp. has released the latest version of its time and billing program, **Timeslips Deluxe**. The product's new Billing Assistant helps you produce bills, while the customizable Navigator module gives you point-and-click access to the program's functions. The \$179.95 Personal-Plus version records expenses for two people, while a \$299.95 single-user version of the full product handles up to eight separate expense accounts. 800-285-0999.

With Quick Restart from **PowerPro Software**, now in Version 1.3, you can power down your PC even if you have applications open, and when you resume work, your PC will reset itself to exactly the place you left off in 8 to 10 seconds. This new version (\$59.95) supports 32-bit disk access, a number of third-party memory managers, and **Stacker 4.0** and a number of earlier compression packages. 415-345-9278.

MindWorks Corp. has begun shipping **Recollect Gold**, a document image management package that supports fuzzy search, document thumbnails, and templates for specifying multiple OCR zones on a single page. 800-396-6463.

You still get a 5 percent rebate on any plane ticket you book through **Personal ExpertWare's** Air Travel Manager (**AirTM**) software, but now you can access lower hotel rates as well. Using the **Eaasy Sabre** system on **CompuServe**, **AirTM** fully automates the reservation and booking process at over 27,000 hotels, condos, and resorts. 800-451-9273.

Keep your eye on **PaperDisk**, a new paper-based compression scheme from **Cobblestone Software** that closely resembles **Infomaging's** 3D Fax, (New & Improved, June 27, 1995). **PaperDisk** compresses and encodes any file and then prints out the code on paper. You can fax the code to someone else, who can scan the sheet into another PC—where **PaperDisk** unencrypts the code, restoring the file. The company claims higher compression rates than for 3D Fax, and the \$149 list price (\$99 until October) is competitive. 617-863-0035.

With **LinkWiz**, a file-transfer utility from **PCX**, you can move files between two PCs via included cables, even if the two operating systems are not the same. **LinkWiz** supports DOS 3.1 or later, OS/2 2.1 or later, and Windows 3.x or later. You can even clone the contents of a source hard disk onto another PC. 800-800-4729.

SPRY Adds WinCIM to the Internet Box

Version 2.0 of **SPRY's** Internet in a Box (IIB) features over 50 enhancements, but more important is the competitive pricing structure of this release. Now that it's part of **CompuServe**, **SPRY** has understandably integrated **WinCIM** into the \$99 IIB software. The Silver Surf Club membership entitles you to 7 hours of Internet connection at \$9.95, while the Gold Internet Club membership gives you 20 hours for \$19.95. You can configure your software to give you simultaneous connection to **CompuServe** and the Internet (both of which count as billed connect time) or separate connections (and then only Internet time is counted as billed connect time, affording you unlimited basic **CompuServe** services). With this second option, however, you can't toggle between **CompuServe** and the Internet as you can with a simultaneous connection. Confused? Wait a couple of months: The release of Windows 95 should change the pricing structure even more, possibly for the better. **Internet in a Box, Version 2.0.** Estimated street price: \$99. **SPRY/CompuServe Internet Division, Seattle, WA;** 800-557-9614 ext. 26; e-mail, iboxinfo@spry.com.

Circle 427 on reader service card

WinFax Scanner: Delrina Incorporates Hardware

Billed as a fax machine replacement system, the \$299, 3.5-pound **WinFax Scanner**, from **Delrina Corp.**, ships with **WinFax PRO 4.0** and **Xerox's** **TextBridge Pro 3.0**—both of which are integrated into a single **WinFax Scanner** desktop. From with-



FAX AND MORE: The 300-dpi **WinFax Scanner** ships with fax and OCR software.

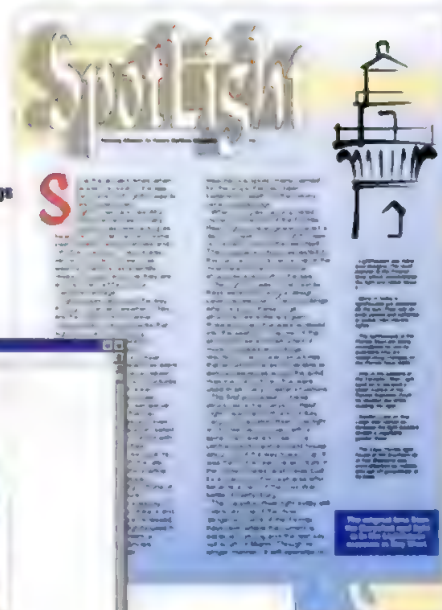
in any Windows app, you can scan at up to six pages per minute at 100 to 300 dpi. The Scanner software loads automatically, and you can fax, print, or handle OCR from a central desktop. The Scanner ships with a ten-page automatic feeder. **WinFax Scanner.** Estimated street price: \$299. **Delrina Corp., San Jose, CA;** 800-268-6082.

Circle 428 on reader service card

CANVAS.™ YOUR ONE-STOP GRAPHICS SHOP

One Program Does it All!

- Newsletters and Flyers
- Logos and Advertising Design
- Free-form Drawing and Painting
- Business Graphics, Flow Charts & Diagrams
- Floor Plans, Architectural & Technical Drawings
- On-Screen Presentations and Slides
- Retouch, Color or Trace Scanned Images
- Color Separations
- Spectacular Special Effects



"... tools like cubes, concentric circles, parallel lines and starbursts make creating complex elements as easy as dragging the mouse."
- PC Magazine

"... a truly versatile drawing and illustration package."
- Windows Magazine

Everything You Need to Create Great Looking Graphics. Fast.

THE EASY-TO-USE DRAWING PROGRAM FOR BUSINESS, DESIGN, TECHNICAL ILLUSTRATION AND MORE!

No matter what your graphics needs are, Canvas helps you do it faster — and easier! All the tools you need to take any idea from concept to printed page are conveniently located in a single, intuitive application.

IF YOU CAN CLICK THE MOUSE BUTTON, YOU ALREADY KNOW HOW TO USE CANVAS.

Canvas' friendly interface gives you instant access to all your graphics tools — using handy resizable, floating palettes and pull down menus. Yet, beneath this intuitive interface lies a proven graphics powerhouse that can take your work all the way to finished film.

LOADED WITH VALUE — AT A PRICE ANYONE CAN AFFORD.

At almost half the price of its closest competitor, Canvas is an unbeatable value. And now we've made it even better by including in every box a CD-ROM jam-packed with more than 10,000 premium clip art images and over 2,000 professional TrueType text, display and novelty fonts — more than any other package at any price!

SO WHAT ARE YOU WAITING FOR?

Run today to your favorite software retailer or call us and get your hands on the best graphics software buy around.

"Core! Draw and Microgratz Designer had better take notice — there's a new gunslinger in the Windows illustration market and it's aiming to become top draw."
- PC World

"... armed to the teeth with top-notch design tools."
- PC World

"... Canvas is an excellent buy."
- Computer Shopper



\$269
Estimated Street Price

\$99⁹⁵
Competitive Upgrade Price

CANVAS INCLUDES

- CD-ROM with 10,000 clip art images & 2,000 TrueType Fonts
- Unlimited Free Technical Support
- 90-Day, Risk-Free Money-Back Guarantee

COMPETITIVE UPGRADE

- Simply show us proof of ownership of any Windows graphics program and chop nearly \$300 off Canvas' already low \$399 price! Visit your favorite reseller today or call

1-800-733-6322





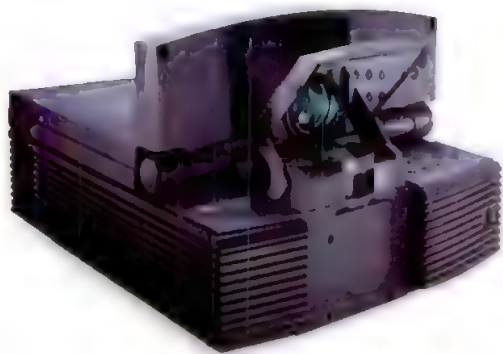
It all comes down to tomorrow's presentation.

You've been there many times before. The night before the big presentation. You want to make last minute changes. But there's no time to make new slides or transparencies.

Presenting the Proxima Desktop Projector 2800. It's a whole new way of looking at presentations. It connects directly to your PC or Macintosh and allows you to project anything on your computer screen onto a large screen or wall. Everything from simple charts to full-motion multimedia presentations. Plus, Proxima's unique Cyclops® interactive pointer system lets you control your software from anywhere in the room.

Best of all, the Proxima Desktop Projector 2800 is easy to set up and use. Find out how owning one can help you be more professional and more successful than ever before.

Times like these make you glad you own a Proxima® Desktop Projector.™



**Call 1-800-799-3331,
ext. 114, for your free
information kit and
enter to win a \$15,000
portable Desktop
Projection System!**



PROXIMA®

THE DESKTOP PROJECTION COMPANY

*No purchase necessary to enter. Void where prohibited. Sweepstakes entries must be received by 8/31/95. For complete rules, call 1-800-799-3331, ext. 114. Desktop projector system includes a Proxima Desktop Projector 2800 and your choice of either a Macintosh PowerBook 540C or an IBM ThinkPad 755CD. Retail value \$15,000 (\$20,895 Canadian). Main Office: 8440 Carroll Park Drive, San Diego, CA 92121-2296. (619) 457-5885. FAX: (619) 457-8847. European Office: Postweg 24, 8131-RK Boven, The Netherlands. +31-43-650-248. FAX: +31-43-649-220. Proxima and Cyclops are registered trademarks of Proxima Corporation. Desktop Projector and Desktop Projection are trademarks of Proxima Corporation. Other trademarks are the property of their respective owners. U.S. and foreign patents are pending. Copyright 1995 Proxima Corporation. All rights reserved. Specifications subject to change without notice.

CIRCLE 140 ON READER SERVICE CARD

Read Only

REVIEWS OF THE LATEST BOOKS FOR THE PC USER

Edited by Tin Albano

The First Book About the Web's HTML Standard

BY EDWARD MENDELSON

All the hyperlinked pages that you can visit on the World-Wide Web were created using the Web's Hypertext Markup Language (HTML). Until recently, the most effective way to learn how to write HTML pages was to download existing pages and modify them to suit your needs. All this has changed with the appearance of *The HTML Sourcebook*, by Ian S. Graham, a complete, step-by-step guide to designing, editing, and managing Web pages.

HTML documents are structured according to strict rules. All text, text attributes, embedded graphics, and hyperlinks are *elements* that are identified by *tags* at the start and finish of each element. Elements can be located only in certain places in an HTML file, and each must be carefully placed in relation to other elements.

The HTML Sourcebook

The HTML Sourcebook covers Version 2.0 of the HTML specification, with some details on proposed additions. New additions to the specification are proposed almost weekly, so readers of this book will want to consult two Web sites for the latest information. For the draft of the HTML Version 3 specification, point your browser to

<http://www.hpl.hp.co.uk/people/dsr/html3/CoverPage.html>

and for the proprietary Netscape extensions to HTML, some of which will also be part of Version 3.0 of the official specification, look at

http://home.netscape.com/assist/net_sites/html_extensions.html

guides you through the logical structure and practical details of creating text, lists, tables, and links. It shows you how the same HTML file displays differently in various text-based and graphics-based Web browsers and describes in detail the ways in which different browsers support different subsets of HTML.

Photoshop Pixel by Pixel

BY DANIEL GROTTA AND SALLY WIENER GROTTA

Mark Siprut's *Adobe Photoshop Handbook* is a well-written book that is useful for both novices and old-timers. The *Handbook* supplements Adobe Photoshop's own documentation with vital, down-to-earth instruction and advice on mastering the practical day-to-day issues of creating, perfecting, and outputting images.

It's all here: an overview on image editing software, a discussion on Macs versus PCs (the

book covers both platforms), how to get started, the differences between Photoshop 2.5 and 3.0, tweaking your system for maximum performance, a first-rate appendix and useful glossary, and a comprehensive overview of the all-important input and output issues. Siprut discusses in detail 3.0's new tools and features, especially layering. He also includes step-by-step descriptions by nearly three dozen prominent artists of images they created, along with their thoughts on what they found most significant or relevant.

Rob Day's *Designer Photoshop* was written specifically for new users. It quickly cuts to the chase by defining and explaining, in context, all the elements that must be learned and applied to master Photoshop. It is, however, not a how-to, by-the-numbers blueprint of a book that will teach you how to create specific images or effects. Rather, the relatively simple cause-and-effect approach graphically demonstrates how your monitor's specs,

editors, viewers, and browsers. *The HTML Sourcebook*, by Ian S. Graham, \$29.95. John Wiley & Sons, 800-225-5945; ISBN: 0-471-11849-4.

Circle 537 on reader service card

chosen resolution, scanning method, and selected output device all affect your final image.

What *Designer Photoshop* doesn't do is follow through on detail. The book is too short by half; every time the reader is about to learn something important, the author moves onto another subject. In addition, the chapters and sections aren't organized in logical order. The book is more like an unrelated collection of tips, tricks, techniques, and explanations.

Despite its shortcomings, *Designer Photoshop* contains numerous gems of experience and information that will help novices better understand and quickly learn Adobe Photoshop. *Adobe Photoshop Handbook*, by Mark Siprut, \$32. Random House Electronic Publishing, 800-793-2665; ISBN: 0-679-75325-7.

Circle 538 on reader service card

Designer Photoshop, by Rob Day, \$30. Random House Electronic Publishing, 800-793-2665; ISBN: 0-679-75326-5.

Circle 539 on reader service card

READ ONLY RECOMMENDS



Looking for information on early American history? Want to see reviews of the latest movies or CDs? It's all out there, but where in the Web is it? Patrick Vincent's *Free Stuff from the World Wide Web* can help you find exactly what you're looking for. \$19.99; Coriolis Group Books, 800-410-0192; ISBN: 1-883577-27-6.



*This finger checks
the software*

*This finger checks
the hard drives*

*This finger checks
the software*

Apple, the Apple logo, Mac OS, and the Mac OS logo are trademarks of Apple Computer, Inc., registered in the U.S. and other countries. All other trademarks are the property of their respective owners. © 2000 Apple Computer, Inc. All rights reserved.

*This finger checks
the system memory.*

*This finger
inventories monitors.*



Introducing the new Compaq Deskpro

Walk. Walk. Walk.

Check computer.

Walk. Walk. Walk.

Check computer.

Walk ten hours a day, five days a week and you realize walking, running and trudging from one PC to the next is no way to manage a network.

To make life a lot more efficient and a lot less aerobic, we've designed a network ready PC you can manage, monitor and even inventory from a single location, single-handedly. (Did you get all that?) Reintroducing the Compaq Deskpro.

AT COMPAQ, IT DAWNED ON US THAT
IT'S A LOT EASIER TO MAINTAIN A NETWORK
OF PCs BY HAND THAN BY FOOT.

This PC literally and technologically is like no other out there. How so? Well, our engineers designed the Deskpro to tell you who it is, what it's doing and how it feels. So now, managing a network doesn't involve guesswork or footwork.

For a more in-depth look at what the Deskpro is capable of, just call your local Compaq reseller. And feel free to put your feet up while you do it.

*This finger is a thumb.
It's only good for the space bar.*

COMPAQ

CIRCLE 137 ON READER SERVICE CARD

AN NEC MULTISYNC® MONITOR?

AT THIS PRICE?

DID SOMETHING FREEZE OVER?

Well, here's something you probably didn't expect. Those premium NEC monitors that always seemed a bit beyond your reach have now eased their way right into your price range. Introducing the NEC MultiSync XV Series. Featuring our new 17" monitor (13.6" viewable image size), the optimum size for today's applications at the incredible price of only \$799*.

MultiSync XV Series monitors are not only designed for your budget, but for the eyes of the people who will use them. Eyes that demand sharp detail, bright colors and crystal-clear images. Which is precisely what these monitors deliver.

The XV Series also delivers the legendary quality and reliability you expect from NEC, and is backed by a 3-year limited warranty — one of the best in the industry.

Plus, the XV Series is ideal for both PC and Macintosh® systems and is one of the only monitor lines in its class to offer Microsoft® Plug and Play compatibility.

In short, the new MultiSync XV17 and the entire XV Series gives you yet another compelling reason why you should consider a separate monitor purchase, and not just settle for the monitor that comes bundled with a system.

The new NEC MultiSync XV Series. Above and beyond your expectations, not your price range. Call 1-800-NEC-INFO for more information. For information sent via fax, call NEC FastFacts™ at 1-800-366-0476 and request catalog #1.

**SEE, HEAR
AND FEEL THE
DIFFERENCE?**

NEC

*Estimated selling price. **Maximum resolutions based on horizontal and vertical frequencies only. NEC cites recommended resolutions for optimal display performance. See, Hear and Feel The Difference. XV17, XV13, XV14 and FastFacts are trademarks and MultiSync is a registered trademark of NEC Technologies, Inc. All other trademarks are the property of their respective owners. NEC GSA#G800K04AGN5241 ©1995 NEC Technologies, Inc.

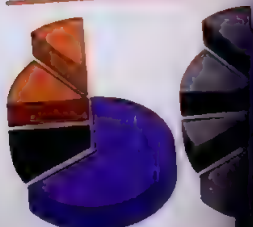


\$799
ESTIMATED
SELLING PRICE

Sales-O-Gram

To: All Sales Representatives
From: Kanton O'Keeffe
Sales Manager
Subject: Persuasive power of color presentation

- Color increases ad readership
- Color ad increases sales 42%
- Color documents provide
- Color improves attention



proves
on per
ack

Statistics
Agreement
Comprehension
Attention
Persuasion

111 CARR Report No. 237.55 "Direct U
shop" - Publishers Publishing Co.
12) "Cylinder and solid press work and
\$200 internal report of color work
per Association of America

COST CONTAINMENT REPORT



Business Color Print

COLOR PPM



COST PER PAGE



PRINTER PRICE



Tektronix

Color is color, unless it's brilliantly practical.

It's the business printer you've been waiting for. Professional color so reliable, inexpensive and easy to use, it's a practical office tool. Speed? It's the world's fastest desktop color printer at 4 color pages per minute. Cost? Full text pages on plain paper at 3¢ each. Color for 11¢ on office papers. Simplicity? If you can load a stapler, you've mastered this machine. Reliability? Add 700 sheets and let

it run overnight. That's robust. Price? At \$4,995, nothing in its performance range even comes close. Best of all, it's from Tektronix, an industry leader, making world-class color printers for 13 years. **The Phaser 340 Color Printer.** So practical, it's brilliant.



Call 800-837-8700, Ext. 1042
http://www.tek.com/CPadP1042

© 1995 Tektronix, Inc. All rights reserved

Tektronix

CIRCLE 001 ON READER SERVICE CARD



Michael J. Miller

The Windows 95 FAQ File

Everywhere I go these days, I get asked the same question: "Do you think Microsoft will get Windows 95 out on time?" My short answer is yes, but before I can elaborate, I'm barraged by a dozen or more questions about Microsoft's much-anticipated

upgrade. Some people can't wait to get their hands on Windows 95, others are scared of making the switch, and some think it's all much ado about nothing. Here are my answers to their most frequently asked.

Will Windows 95 be available on August 24?

Microsoft has gone too far for this not to happen. The rollout is planned, and the prices are settled. An upgrade kit for Windows, OS/2, and Windows NT users will have an official estimated street price of \$109.95 (\$209.95 for the full version). Hardware manufacturers and many third-party developers are geared up to introduce products of their own at this date, too. It would cost Microsoft too dearly to pull back now.

Will the Department of Justice get in Microsoft's way?

The only way I can see the Department of Justice interfering is if it issues an injunction that would prevent Microsoft from shipping Windows 95 with The Microsoft Network built in. I expect Microsoft would fight this hard publicly, but if push came to shove, Microsoft would be able to remove MSN from Windows 95 fairly easily. Removing MSN from the documentation would take a little more time.

Will Windows 95 have bugs?

Yep. Every newly released operating system or application has bugs. It's unavoidable.

How serious will the Windows 95 bugs be?

No one knows. We'll get a better idea after the final version has been in use for a while. Microsoft expects to ship a series of fixes called Tune-Up packs on a regular basis.

Will certain Windows 95 features cost extra?

If you have a fast 486- or

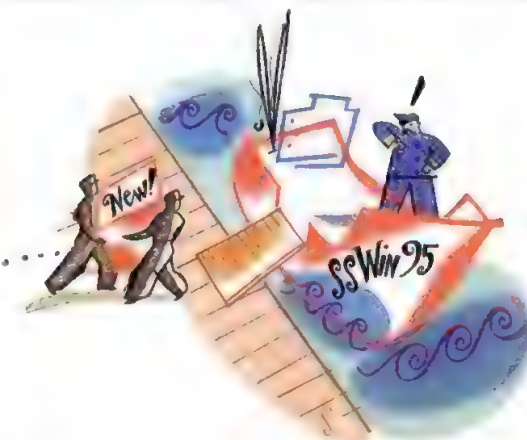
Pentium-based system, Microsoft will try to sell you Microsoft Plus! for \$49.95. It has a number of things that I think should be in the base operating system, or at least in the CD version. There's a system agent that automatically schedules maintenance items such as disk defragmenting, a better set of hard disk compression tools that supports higher compression, and a set of Internet utilities that includes a Web Browser. Microsoft Plus! will also include a collection of screen savers, colors, wallpapers, sounds, fonts, and even a 3-D pinball game. All this stuff looks cool, but it takes another 25MB to 40MB of hard disk space.

Will Windows 95 be very compatible and very stable?

Compatibility is difficult. At this point, there are more applications and more configurations of machines, device drivers, and applications than anyone could possibly test. Waiting won't make it better, because new machines and new applications keep coming. As far as stability is concerned, I've yet to see the "crash-proof" operating system.

To some extent, operating systems have to make a trade-off in their architecture between being as compatible as possible and as stable as possible. Because Windows 95 has some DOS structure and can run many existing real-mode device drivers written for Windows 3.1, it's compatible with a lot of older applications. But when that real-mode code crashes, it can cause trouble for the entire operating system.

If you were to order the major x86 operating systems by compatibility (from most to least), the list would probably go like this: Windows 3.1, Windows 95, OS/2 Warp, and Windows NT. Yet if you had to order them by sta-



The most eagerly anticipated upgrade of the decade is getting ready to ship. Will it get to your city on time?

Michael J. Miller

bility, you'd probably discover that the OSs were in reverse order. (Windows 95 does a much better job of running your existing Windows device drivers than other platforms do.)

Will Windows 95 will work on a 386DX-based system with 4MB of RAM?

Yes; we've seen prerelease copies of Windows 95 work on 4MB systems and operate existing Windows 3.1 applications the same or only slightly slower than they natively run. But so what? If you're moving to Windows 95, you probably want some newer applications, and you'll want to try multitasking. That just won't work well with only 4MB of RAM.

The same is true for OS/2 Warp. If you don't have at least 8MB, you're not going to be happy (Microsoft Exchange and The Microsoft Network won't work unless you have at least 8MB of RAM). You'll also want 35MB to 40MB of free hard disk space.

Is memory more important than faster processor speed?

An additional 8MB of memory costs around \$350—about the difference between a machine based on a 75-MHz Pentium and one based on a 100-MHz Pentium. Unless you're running a single processor-intensive spreadsheet or engineering application that fits in 8MB, you'll be happier with a slower processor and 16MB of RAM than you will with a faster processor and only 8MB. More memory helps with multitasking chores.

Will Windows NT Workstation vanish?

No. Just because Microsoft now has another 32-bit multithreaded, multitasking operating system doesn't mean that Windows NT is done for. Windows NT is more stable, has more security, and doesn't require much more memory than Windows 95. It will also run Windows 95 applications natively, so when such apps become widely available (and when the version of Windows NT with the Windows 95 shell shows up in the beginning of 1996), I won't be surprised if some large corporate customers decide that Windows NT is actually the right way to go.

Will OS/2 vanish?

No. The OS/2 Warp folks aren't going to just up and disappear. Those who have committed to it tend to be some of the most vocal users I've ever seen. The companies that have invested in custom applications are still committed to it and there is a glimmer of hope for more applications with companies like Corel signing up. Now that IBM has bought Lotus, it has an internal source of top-flight productivity and communications applications.

Will Windows 3.1 vanish?

No. I expect that a year from now, a great proportion of large sites will still be running Windows 3.1 instead of any other alternative. This is because they have machines that won't run Windows 95—in other words, machines with only 4MB of RAM—and they have applications that run very well on Windows 3.1.

Inertia also comes into play. If an application is working, corporate MIS folks won't change until they see a clear benefit. We won't really see a big change until we see the shipping applications and people conclude that moving to Windows 95 will help them do their jobs better. □

GUIDE TO ELECTRONIC EDITIONS

Connect with PC Magazine



PC MagNet (ZiffNet/CompuServe)

Features Plus: Join our editors from July 24-28 in a roundtable discussion with manufacturers about the cutting edge of Pentium technology. (GO EDITOR)

Downloads: Our featured utility, WCompare, compares and edits two different text files (GO FREEUTIL)

To join, set your communications software for 7 data bits, even parity, 1 stop bit, and full duplex. For the access number nearest you, dial 800-346-3247. At the prompt, enter PHONES and follow the menus to find the number nearest you. Hang up and dial the number. At the HOST NAME prompt, enter CIS. At the USER ID prompt, enter 177000.5000. Enter PC*MAGNET at the PASSWORD prompt and PCMCIS95 at the ENTER AGREEMENT NUMBER prompt. When you join ZiffNet, you will be enrolled in both ZiffNet and CompuServe, for a charge of \$13.45 a month. Connect time charges are \$4.80 an hour.

PC Magazine on the Web

Visit us at <http://www.ziff.com/~pcmag>

Features: Read Your Portable Persona as a hypertext document on PC Magazine's Web page.

Downloads: Our featured utility, WCompare, compares and edits two different text files (GO FREEUTIL)



PC Magazine CD Summer 1995 Issue (Vol. 3, Disc 2)

- Exclusive! Windows 95 video preview
- The Perfect Desktop, Notebook, and Server PCs in interactive format
- PC Labs tests 100 Pentium PCs, sortable in our Benchmark Viewer™

- Full-motion videos guide you through a smart multimedia upgrade
- Multimedia notebooks let you go mobile. Includes interactive Price/Performance and Battery Life Viewers
- PLUS! A full year of PC Magazine text in searchable format and PC Magazine's benchmark tests and utilities



Available at computer retailers or by subscription at 800-787-9677.

PCs from Acer Direct

*Introducing
the new,
fully modular
AcerNote Pro*

PCMCIA
Fax/Modem

Removable
Hard Drive

Touchpad

CD-ROM Drive
-swaps with
Floppy Drive
or Lithium Ion
battery

Internal AC
-swaps with
NiMH battery

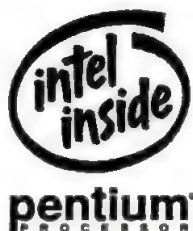
All you need
for business
computing

Acer 



AcerNote™ Pro P75MHz

- 75MHz Intel® Pentium® Processor
- 8MB System RAM (Expandable to 40MB)
- 10.4" Active-Matrix LCD Displays 256 Colors
- Externally Removable 500MB 2.5" Hard Disk Drive
- 2 PCMCIA Type II/ 1 Type III Slot
- Built-in Touchpad Pointing Device
- Externally Removable 1.44MB Diskette Drive
- Dual-Battery Operation
- Secondary Lithium Ion Battery Option (When Available)
- 1MB PCI Bus Video with Graphics Accelerator
- 16-Bit Sound Blaster™ - and Windows® Sound Systems-Compatible Stereo Audio Onboard
- Full-Sized 82-Key Keyboard
- Simultaneous Notebook Display and External Monitor (CRT) Support
- Separate Status LCD Display
- Slim 8.97" x 11.7" x 1.97" System Case Weighs 6.4 lbs., Including NiMH Battery
- MS-DOS® 6.2, Microsoft® Windows 3.1 and Productivity Pack, Personal Organizer and Hoyle Classic Card Games Included
- Microsoft Office v4.2
- Three-Year Limited Warranty with One-Year Next-Business-Day Replacement in U.S. and Canada



\$3,999

DOCKING STATION ONLY

Docking Station Features Include:

- 3 ISA Expansion Slots, 3 Storage Bays (1 Internal/2 External)
- Removable Top Cover for External CRT
- Battery Charger Bay to Recharge Batteries During System Use

\$599

Business Leasing Available



Whatever your work philosophy:

MORE FOR LESS

THE ACERNOTE PRO

MEET THE MOST POWERFUL AND FLEXIBLE NOTEBOOK IN THE INDUSTRY

This remarkably flexible notebook features interchangeable modules for CD-ROMs, floppy drives, AC adapters, battery packs and hard drives. The ultimate desktop replacement, it's what today's power users want—a system that's adaptable to the office, on the road, for client presentations, and more. Ideal for mobile sales forces, executives who bring work home, and small-business and home users.

A DAY IN THE LIFE OF AN ACERNOTE PRO

8:30 AM

At the office:

Now you can connect to a docking station for full PC power including CD-ROM, and recharge extra batteries simultaneously.



11:16 AM

At the presentation:

For multimedia, swap the floppy drive module with the CD-ROM drive and use the internal AC adapter as your power source.



6:11 PM

On the plane:

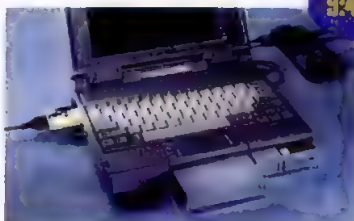
For extra long life, swap the floppy drive and internal AC adapter modules with the Nickel Metal Hydride (NiMH) and lithium ion battery* packs.



9:42 PM

At the hotel:

Use the built-in PCMCIA port to fax or modem. To recharge while you work, swap out the internal AC adapter for a battery pack, using the AC adapter externally.



OR LESS IS MORE

THE ACERNOTE LIGHT

INTRODUCING THE LIGHTWEIGHT NOTEBOOK FOR BUSINESS TRAVELERS

As the "slimline" member of the AcerNote notebook family, the AcerNote Light is a lightweight notebook that offers all the features of a full-sized notebook—at a very affordable price. It has plenty of power for word processing, spreadsheets and remote communications. It's expandable to 32MB RAM. And, its lightweight (5 lbs.) makes it the ideal traveling companion as well as the perfect complement to existing home or office systems.



AcerNote Light 75MHz

- 75MHz IntelDX4™ Processor with Built-In 16KB Cache
- 8MB System RAM (Expandable to 32MB)
- 10.4" Dual-Scan LCD Displays 256 Colors
- 420MB Upgradable Hard Disk Drive
- 1 PCMCIA Type II Slot (1 PCMCIA Type III Slot Module Available as Accessory)
- Built-in Touchpad Pointing Device
- 1MB Video Memory
- Secondary Lithium Ion Battery Option (When Available)
- Simultaneous Notebook Display and External Monitor CRT Support
- Slim 8.2" x 11.7" x 1.7" System Case Weighs 5.0 lbs., Including Duracell® NiMH Battery
- Full-Sized 82-Key Keyboard
- MS-DOS 6.2, Microsoft Windows 3.1 and Productivity Pack, Personal Organizer and Hoyle™ Classic Card Game Included
- Microsoft Office v4.2
- Three-Year Limited Warranty with One-Year Next-Business-Day Replacement in U.S. and Canada

NEW

\$2,699

Business Leasing Available



THREE-YEAR LIMITED WARRANTY

The new AcerNote Light and AcerNote Pro are backed by an outstanding three-year limited warranty. For the first year, Acer provides toll-free technical support 24 hours a day. Plus, Acer offers Next-Business-Day Replacement in the U.S. and Canada. This means within 24 hours of your call, we'll loan you a computer for free—and you can keep it until we're done servicing your computer. For years two and three, Acer offers a Carry-In or Mail-In warranty, in which you simply bring in your AcerNote to the Customer Service Center nearest you, or mail it directly to Acer.



For immediate delivery,

Call 800-848-ACER

For a retailer or reseller near you,

Call 800-529-ACER

Monday through Friday 6 AM-6 PM. Saturday 8 AM-4 PM Pacific Time.
Acer computers are also available at fine retailers and resellers.
(Acer computers with Microsoft Office preinstalled are not available at Acer authorized retailers.)

When calling, please reference #085 ACD. Specifications and pricing are subject to change. Prices valid through August 31, 1995. *When Available.

Acer



We know your business needs:

SHEER POWER

ACERPOWER MINITOWERS HARNESS THE POWER OF OUR PENTIUM PROCESSOR SYSTEMS

AcerPower™ P133MHz Minitower

- **133MHz Intel® Pentium® Processor**
- **16MB System RAM**
- 256KB Second-Level Cache
- 1.2GB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- **Quad-Speed CD-ROM Drive**
- 2MB VRAM Diamond Stealth 64 PCI Video Card
- 17" (15.7" Viewable Image Size) .28mm Non-interlaced Digitally Controlled Flat Screen Color Monitor†
- 1.44MB Diskette Drive
- 7 Bay Minitower
- Flash BIOS
- Plug-n-Play Ready
- High-Speed I/O Ports
- Microsoft Windows for Workgroups, MS-DOS 6.2
- **Microsoft Office v4.2**
- 3-Year Limited Warranty with First Year On-site

NEW

\$3,995

Business Leasing Available

04950HK26

AcerPower P120MHz Minitower

- **120MHz Intel Pentium Processor**
- **16MB System RAM**
- 256KB Second-Level Cache
- 1.2GB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- **Quad-Speed CD-ROM Drive**
- 2MB VRAM Diamond Stealth 64 PCI Video Card
- 15" (13.7" Viewable Image Size) .28mm Non-interlaced Flat Screen Color Monitor†
- 1.44MB Diskette Drive
- 7 Bay Minitower
- Flash BIOS
- Plug-n-Play Ready
- High-Speed I/O Ports
- Microsoft Windows™ for Workgroups, MS-DOS® 6.2
- **Microsoft Office v4.2**
- 3-Year Limited Warranty with First Year On-site



\$3,395

Business Leasing Available

04950HK25

AcerPower P100MHz Minitower

- **100MHz Intel Pentium Processor**
- **8MB System RAM**
- 256KB Second-Level Cache
- 1GB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- **Quad-Speed CD-ROM Drive**
- 2MB VRAM Diamond Stealth 64 PCI Video Card
- 15" (13.7" Viewable Image Size) .28mm Non-interlaced Flat Screen Color Monitor†
- 1.44MB Diskette Drive
- 7 Bay Minitower
- Flash BIOS
- Plug-n-Play Ready
- High-Speed I/O Ports
- Microsoft Windows for Workgroups, MS-DOS 6.2
- **Microsoft Office v4.2**
- 3-Year Limited Warranty with First Year On-site



\$2,895

Business Leasing Available

04950HK24

ACER OFFERS A VARIETY OF SPECIAL OPTIONS AND UPGRADES WITH NEW SYSTEM PURCHASES ONLY!

Now when you buy a new Acer computer, you can take advantage of exclusive options and upgrades to customize your system to specific business needs. For increased communications capabilities, you can add on a 14.4 voice/fax/data modem or 28.8 fax/data modem. Or get an Ethernet card for easy networking. For more storage, we also offer a 1.7GB Conner® Tape Drive. Call our 800-number for the latest pricing.



Most Acer Desktops,
Minitowers And
Monitors Are Covered
By A Three-Year
Warranty.

SATISFACTION GUARANTEED!

If you're not happy with your Acer Direct purchase within 30 days, we'll solve the problem to your satisfaction...or you'll get a full refund!



For a retailer or reseller near you,

Call 800-529-ACER

*Acer preinstalls Microsoft Office v4.2 on select AcerPower and AcerNote products with at least 8MB of RAM and a hard drive.
†Acer monitors that are purchased with Acer systems receive a 3-year limited warranty with Next Business Day Replacement Service in the first year.

Please call 1-800-848-ACER for details on the money-back guarantee and limited warranty. Return shipping and insurance charges are the responsibility of the customer. Not available in Canada. On-site service may not be available in certain remote locations. Products, availability, prices and programs are subject to change or cancellation without notice. Shipping and handling charges are extra. Acer, AcerAcros and the Acer logo are registered trademarks and AcerNote, AcerPower, AcerView, ChipUp and SmartCase are trademarks of Acer America Corporation and Acer Inc. Intel and the Intel Inside logo are registered trademarks and Pentium and the Pentium Processor logo are trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. ©1995 Acer America Corporation. All rights reserved.

TOTAL RELIABILITY

ACERPOWER DESKTOPS

THE ULTIMATE BUSINESS SOLUTIONS FOR
RELIABLE AND EASY-TO-USE PERFORMANCE

THE ACER DIRECT BUSINESS SERVICE CENTER CAN HELP YOU BEFORE AND AFTER YOU BUY

Acer provides all the customer service and support you need—right when you need it. Just call the Acer Direct Business



Service Center anytime between 7:00 a.m. and 4:00 p.m. PST and our friendly

technical support staff will be glad to assist you. We can help you configure the perfect system or assist you with your questions. Either way, you'll get the technical expertise you need to solve your most complicated business computing issues. The Acer Direct Business Service Center. Just another way Acer ensures you receive the best value in the industry.

ACER PROVIDES EXCELLENT BUSINESS MULTIMEDIA UPGRADES

If you want superior sound quality, try Acer's popular 16-bit sound card and speakers. For an extra boost of power, you can also upgrade to 10-watt Yamaha® speakers. Plus, add a subwoofer for a truly dynamic sound experience! Call our 800-number for the latest pricing.

For immediate delivery,

Call 800-848-ACER

Monday through Friday 6 AM-6 PM and Saturday 8 AM-4 PM Pacific Time.

Acer computers are also available at fine retailers and resellers. (Acer computers with Microsoft Office preinstalled are not available at Acer Authorized Retailers.)

When calling, please reference #085 ACD. Specifications and pricing are subject to change. Prices valid through August 31, 1995.



AcerPower P75MHz Desktop

- 75MHz Intel Pentium Processor
- 8MB System RAM
- 256KB Second-Level Cache
- 540MB IDE Fast Hard Disk Drive
- PCI Enhanced Local Bus IDE
- Double-Speed CD-ROM Drive
- 1MB 64-Bit PCI Local Bus Video
- 15" (13.7" Viewable Image Size) .28mm Non-interlaced Flat Screen Color Monitor†
- 1.44MB Diskette Drive
- Flash BIOS
- Plug-n-Play Ready
- High-Speed I/O Ports
- Microsoft Windows for Workgroups, MS-DOS 6.2
- **Microsoft Office v4.2**
- 3-Year Limited Warranty with First Year On-site

\$2,195

Business Leasing Available

049501R10

AcerPower 100MHz Desktop

- 100MHz IntelDX4™ Processor
- 8MB System RAM
- 256KB Second-Level Cache
- 540MB IDE Fast Hard Disk Drive
- 1MB Local Bus Video
- Enhanced Local Bus IDE
- 1.44MB Diskette Drive
- 15" (13.7" Viewable Image Size) .28mm Non-interlaced Flat Screen Color Monitor†
- Flash BIOS
- High-Speed I/O Ports
- Microsoft Windows for Workgroups, MS-DOS 6.2
- **Microsoft Office v4.2**
- 3-Year Limited Warranty with First Year On-site

\$1,870

Business Leasing Available

049501R00

Discover The Acer Advantage

15 Years Microcomputer Manufacturing Experience
Top 5 in Units Originally Manufactured Worldwide
All Major Production Facilities ISO-9002 Certified
First in Environmental Ranking (Bund Report, 1994)
Manufactured Over 2 Million PCs in 1994
OEM Manufacturer for Servers, Desktops and Notebooks
Over 800 Microcomputer Research and Development Engineers
Over 200 Microcomputer Patents

Acer



Samsung monitors. Designed from your point of view.



SyncMaster™ 17GLi.

Today's applications demand more from your monitor. That's why Samsung created the GLi Series monitors. They work the way you do.

Performance is only part of the reason to buy a new 17-inch SyncMaster monitor. It has big, bright, crisp, clear images that you can depend on year after year.

Simplicity is also important. The GLi Series offers Plug and Play* compatibility, so you can get right to work. Its intuitive controls and on-screen programming keep concentration where it belongs — on the job.

Plus, Samsung delivers outstanding **Value** — in the comfort of a three-year warranty, and the satisfaction of a competitive price.

If you take your work seriously, think about an exceptional monitor. Think about the SyncMaster 17GLi. After all, it's your point of view.

Call 1-800-933-4110 or use fax-on-demand at 1-800-229-2239 for more information.

SyncMaster™	17GLi	17GLi	17GLi
Flat Square CRT	15"	17"	17"
Dot Pitch	.26"	.26"	.26"
PC Compatibility	1280x1024@60Hz	1280x1024@60Hz	1280x1024@80Hz
Max. Consumption	102W@200mA/150W	102W@200mA/150W	115W@200mA/150W
Color Temp. Selection	•	•	•
VideoCard Compatibility	•	•	•
Limited Warranty	3 Years	3 Years	3 Years

Actual viewable areas are 14.0" (17GLi) and 14.0" (17GLi and 17GLi).



© 1995 Samsung Electronics America, Inc. SyncMaster™ and JustClick™ are trademarks of Samsung Electronics. *When used with Windows 95™ as a Plug and Play capable system conforming to EISA guidelines. Use of the Energy Star logo is not considered to be a product endorsement.



CIRCLE 046 ON READER SERVICE CARD



Bill Machrone

Digital Art Isn't

Art, that is. Digital representations of paintings and photographs are an insult to the artist, to the work, and to our eyes, the most exquisite of our senses. I've looked at the collections of digitized artworks, and the best I can say is that they're less expensive than

a trip to the Louvre or the Sistine Chapel.

Paintings are three-dimensional objects, with subtleties and surface complexities impossible to convey via a monitor. The resolution issue alone is daunting. The continuous tones of a painting are nearly infinite in dots-per-inch terms, and they follow the texture of the canvas or the fibers of the paper. A good four-color offset picture in a magazine gives us between 1,200 and 2,400 dots per inch. A monitor gives us 75 or 100. The resolution of the scanning process and the number of bits of color depth also come into play; they don't help it look any better.

For that matter, consider sculpture. What can a two-dimensional, detail-free, digital rendering of Michaelangelo's David or a Calder mobile tell you about the scale of the original?

I hate to shoot fish in a barrel, but I got a press release the other day that made me laugh out loud. "ANSEL ADAMS GOES ELECTRONIC," it shouted. "World Renowned Photographer's Work Interpreted in a New Medium, on Computer."

Interpreted? Have you ever seen an Ansel Adams photograph? Here's a guy who trundled an 8-by-10 view camera to the most beautiful and forbidding places on earth, spent untold hours setting up, sat in the freezing desert or steamy forest waiting for the subject, the light—for everything—to be right. Then he got down to the hard work in the darkroom. The resulting images were indescribably beautiful.

One of his most famous desert images shows some rocks in the foreground, some distant mountains, and the moon, a quarter of a million miles away, all in sharp focus, with startling detail and subtlety. The tonal scale is so long you'd think it goes on forever—a dozen shades you could call white, a dozen

more of black, and an infinity of grays inbetween. I've seen a signed print, twice. It lives in my memory, but it's far richer than any pixelated image on my monitor.

Is your memory so unreliable that you need to rely on counterfeit images and pale reflections of works of art? Some things are just meant to be ephemeral. Thus some art forms, such as ballet and theater, are virtually unavailable as recorded video. I've seen *Swan Lake* many times, but one night, under the combined spells of Tchaikovsky and the evil sorcerer von Rothbart, principal dancer Merrill Ashley *became* the swan. Afterwards, we all agreed that something exceptional had happened. Imagine how debased the moment would be with a smudge of black pixels where the dancers' eyes should be, their exquisite movements hacked into unrecognizability by herky-jerky video playback, the mesmeric interplay of the strings and oboe mocked by cheesy plastic speakers.

What's that? You don't particularly want a *Swan Lake* screen saver? Then why would you want an Ansel Adams screen saver or a CD-ROM visit to the Louvre or the Uffizi? If you're going to have reproductions of artworks, choose a printed medium with a resolution that at least begins to approach that of the work. Save the pixels for

suitable images, such as flying toasters.

New media demand new artists and new tools. Works of art are created for computers every day. CorelDRAW, Fractal Design Painter, and other creative programs give digital artists a new palette attuned to print and screen. The World-Wide Web is another huge canvas just begging for an infusion of talent and technique. Thus enlivened and enriched, the Web will become as vital and exciting a medium as the magazine you're reading right now, a fertile field for artists and viewers alike. □

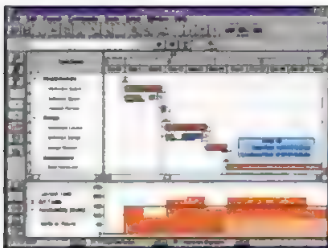


*Culture snobs would say
that pixels should be saved
for flying toasters.*

WE WROTE THE BOOK ON PROJECT MANAGEMENT SOFTWARE.



NOW READ THE REVIEWS.



Once again, Project Scheduler 6™ for Windows™ is being widely recognized by users, the press and throughout the industry for its solid performance, power features, and superior value.

Solid Performance.

After their review of project software last October, *InfoWorld*

wrote: "Project Scheduler 6 for Windows, Version 1.5, scored the most points and is a no-lose bet... You can plan multiple projects without resorting to complicated procedures... Project Scheduler includes a complete, a well-implemented report writer. Finally, Project Scheduler supports enterprise users with the best Open Database Connectivity (ODBC) implementation of the group."

Power Features.

Recently named an Editors' Choice, *PC Magazine* said "Project Scheduler 6 offers industrial strength planning and tracking power in a cleanly designed Windows setting. Exceptionally

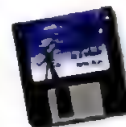


versatile resource handling, built-in report generator, a well-thought out approach to multi-project management, and field-level ODBC connectivity are among its power features."

Superior Value.

"[Project Scheduler 6] provides competitive features and offers several areas of unusual strength (most notably in advanced scheduling techniques, and the handling of multiple

project environments)", commented *Software Digest* in their most current NSTL Rating Report. "Thanks to good charts and excellent calculation, Project Scheduler 6 also offers the best quality overall."



Before you make a project software decision, you've got to see our self-running demo.

Call 1-800-533-9876

End your search for the ideal project management software with Project Scheduler 6 for Windows, and start giving all of your projects a winning approach today!



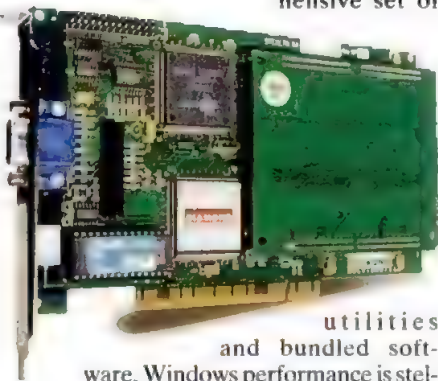
©1995 Scitor Corporation 333 Middlefield Road, Menlo Park, CA 94025 Tel 415-462-4200 Fax 415-462-4301 Internet: sales@scitor.com In France: call (1) 44-32-05-00 In Germany: call (0) 80 53-56-88-1 In the UK: call 0384-382121 In Australia: call (02) 956-7800 In So Africa: call (011) 708-7015 Project Scheduler 6 is a registered trademark, and the Scitor name is a trademark of Scitor Corp. Windows is a trademark of Microsoft Corp. *Entrepreneur Magazine 3, 1994 *PC Magazine April 11, 1995 *Software Digest, January 1995

Second Looks

LIVING WITH THE PRODUCTS WE REVIEW

Diamond Stealth Steals Superlatives

Diamond Multimedia Systems' top-of-the-line Stealth 64 Video VRAM received a well-deserved Editors' Choice in our issue of June 27. Readers like the Stealth 64 for its performance, overall compatibility, and comprehensive set of



utilities and bundled software. Windows performance is stellar, but this is not the board of choice for AutoCAD users because of its average AutoCAD perfor-

mance. Before you rush out and get one, make sure that your BIOS will support the Stealth 64. Some readers have had trouble with older machines and even with older BIOSes on year-old machines.

Diamond's video drivers are reasonably mature, but I've also gotten a smattering of complaints that interactions between disparate elements seem to trip up the driver. Some readers have experienced trouble switching from DOS-based graphics games to Windows and back, but Windows 3.1 is so fragile under these circumstances that it's a wonder this works at all.

Readers praised the InControl utilities, but one reader discovered that if he used the built-in audio function it effectively overrode his saved settings on the Sound Blaster mixer. No big deal—just don't use InControl's audio control if you use the mixer.

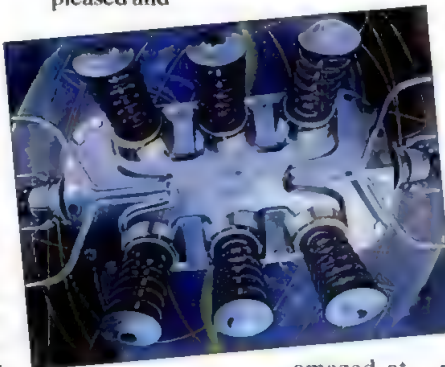
3D Studio Lets the Sunshine In

Some applications have the same effect on me as a bright, breezy morning: They make me glad to be alive. Autodesk's 3D Studio is one of these. It takes the underlying complexities of 3-D rendering and makes them more or less a walk in the park. In this park, though, you control the sun, the shadows, the camera angle, and the color and shading. Sure, there's a learning curve, as with any powerful application, but it's nowhere as bad as you might think.

Autodesk is adding features to 3D Studio all the time, and users love the new animated texture maps.

How to contact Second Looks: On ZiffNet type GO ZNT:EDITOR, and choose Views: Machrone. Contact Machrone directly via MCI Mail at Wmachrone or CompuServe at 72241.15. You can also find us on the World-Wide Web at <http://www.ziff.com/~pcmag>.

Readers rave about 3D Studio's documentation, especially the tutorial. One reader, a photographer and fine-arts graduate student, was pleased and



amazed at the sophisticated animation he created after two weeks of study.

Readers are also very pleased with Autodesk's on-line support forum. Instead of being full of complaints about bugs and incompatibilities, it is jammed with people helping one another with technique and some of the more esoteric features.



Remove-IT or Lose It

Vertisoft Systems was one of the pioneers in Windows application removers, with an excellent understanding of the underlying complexities of removing files, but it had a few, shall we say, shortcomings. Remove-IT works best if it is installed on your system before you install new applications, because it logs everything the installation does and then reverses the actions when you deinstall. Removing applications that were not installed with Remove-IT's supervision can be dicey, but the undo feature gets you back to where you were if things go awry.

On systems with CD-ROMs, Remove-IT may try to read the CD each time you attempt to delete. The workaround is to keep any old CD in the drive; the fix comes in Version 2, which just shipped. Version 2 also modernizes the monitoring approach, moving it from a DOS TSR to a 32-bit Windows VxD. It sports a knowledge base of nearly 850 applications so that it can uninstall them correctly and completely. Vertisoft has also skewed the product's emphasis a bit: The new version prepares your system for the upgrade to Win 95 by removing all the unneeded pieces of Windows 3.1.

LOOKING AHEAD

Tell me what you love and hate about these products and we'll share the information in future issues.

AOL, CompuServe, Prodigy Internet-access kits	Quad-speed CD-ROMs
IBM ThinkPad 755CD	Toshiba Portégé T3600GT
LANTastic for OS/2	Warp Connect
PCMCIA modems	WordPerfect 6.1
	ZDS 2-Noteflex

O n A u g u s t 2 4 t h d o n ' t p l a n
5 3 r d w o r l d s c i e n c e f i c t i o n

on spending the entire day at the
convention in glasgow, scotland.

Ambra™ – Pentium Power In Your Networked or Home PC.



ZEOS® Ambra™ computers are not just another line of systems. They're slim little powerhouses that are the ideal solution to your network or home needs.

It starts with plenty of muscle—we give you a choice of Intel processors from 486DX2-50 all the way up to a Pentium-100. You also get on-board local bus video and enough bays to add a 4X CD-ROM, 5.25" floppy drive and tape backup. The best news: all this comes at a lean price that will leave a little green in your pocket.

Speaking of green... ZEOS Ambra computers are green—meaning they use less energy. And that's important because Ambra PCs cut down on pollution and lower your electricity bill. That can translate into big savings for you and your company!

To save you even more money, we lowered prices *and* offer you several money-saving packages (many ready to ship the day you order) or the option to custom build a system to your exact needs. If you need a diskless workstation, we can even remove the hard drive and floppy disk drive, and install a network card.

What's more, the Ambra is compatible with all major operating systems on the market.

You also get award-winning after-the-sale support. No company has won more *PC Magazine* Readers' Choice for Service & Reliability awards than ZEOS—seven in all!

So whether it's connected to your network or plugging away at the home office, the ZEOS Ambra is the optimal solution for all your word processing or spreadsheet needs. It's the little powerhouse with a big punch at an exceptional value. Call a ZEOS Systems Consultant at 800-554-7172 to order today.

800-554-7172
24 Hours a Day • 365 Days a Year



CN! —We can ship today! Call for details.
Fax Orders: 800-362-1205 or 612-362-1205 Phone Orders:
Outside U.S. and Canada: 612-362-1212, Government: 800-245-2449. ZEOS Information Systems, Inc. GSA# GS00K94AGS5176 Purchase Orders, MasterCard, VISA, Am Ex, Discover, Z-Card, COD and affordable leasing programs.

Purchase orders are subject to approval. Business leasing programs available. All prices, specifications and availability are subject to change without notice. Call to confirm these and warranty details. Prices do not include shipping. Intel compatibility is Developer Tested Only. Intel makes no warranties with respect to this product. The Energy Star emblem does not represent EPA endorsement of any product or service. All products and company names are trademarks or registered trademarks of their respective holders. Intel Inside is a trademark of Intel Corporation. ZEOS is a registered trademark. Z-Card is a servicemark. Ambra is a trademark of Micron Electronics, Inc. © 1995 MEI ZEOS, 194 Industrial Blvd., Minneapolis, MN 55413 USA. Micron Electronics, Inc. is a publicly traded company (NASDAQ symbol: MEI). AMB PC4 9/95

Installed With Every ZEOS Ambra™

- ▶ Genuine Intel® 486 or Pentium processor.
- ▶ 256K SRAM cache.
- ▶ Two serial ports, one parallel port and one mouse port integrated.
- ▶ Four free expansion slots: one local bus and three 16-bit ISA.
- ▶ Small footprint case with four bays.
- ▶ System speed selectable through the keyboard.
- ▶ 200 watt power supply, switchable between 115/230V.
- ▶ ZEOS 101-key space-saving keyboard.
- ▶ Password feature built-in ROM for security.
- ▶ EPA Energy Star compliant.
- ▶ FCC Certified Class B; UL listed.
- ▶ ZEOS Customer Satisfaction Package.

Package 1

486DX2-50	\$1145
486DX2-66	\$1195
Pentium-75	\$1595
Pentium-90	\$1695
Pentium-100	\$1845

- ▶ 4MB RAM (486), 8MB RAM (Pentium)
- ▶ 420MB IDE hard drive, 120K cache
- ▶ 35" 1.44MB floppy drive
- ▶ On-board local bus SVGA color video
- ▶ ZEOS 14" 1024 x 768 NI SVGA color monitor, 28mm dot pitch
- ▶ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse
- ▶ MS Works

Package 2

486DX2-50	\$1295
486DX2-66 CN!	\$1345
Pentium-75	\$1895
Pentium-90	\$1995
Pentium-100	\$2145

- ▶ 8MB RAM (486), 16MB RAM (Pentium)
- ▶ 528MB IDE hard drive, 120K cache
- ▶ 35" 1.44MB floppy drive
- ▶ On-board local bus SVGA color video
- ▶ ZEOS 14" 1024 x 768 NI SVGA color monitor, 28mm dot pitch
- ▶ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse
- ▶ MS Works



John C. Dvorak

Note to IBM: Sell the OS/2 Division

It's time to look seriously at the future of OS/2 and what role it will play a decade from now. The overriding sentiment of many OS/2 users (myself included) is that IBM should take the advice of well-meaning pundits and either abandon the product or free

it from the clutches of IBM. The possibility seems remote, as IBM would lose credibility forever after promising one too many times to stick with OS/2 no matter what. However, the problem is that IBM itself is a hindrance to the success of OS/2. I suggest that IBM cut loose the entire OS/2 group, along with the PC-DOS folks, exactly as the company did with the Lexmark division.

In March 1991, IBM spun off its entire Lexington, Kentucky printer and typewriter division to the New York investment firm of Clayton & Dubilier. The transaction was worth an estimated \$1.5 billion, and IBM kept a 10 percent stake in the independent company, which was renamed Lexmark. The spin-off was an unqualified success. Lexmark has been able to use IBM research and the IBM name for a few years. Out from under the yoke of the IBM bureaucracy, Lexmark quickly jumped into desktop laser printers and soon became a top player.

Maybe John Akers was right in getting the wheels turning for a sell-off of the OS/2 division, a policy that has been reversed by current chairman Louis Gerstner. The fact is, IBM can't continue to throw money at OS/2. Intel's Andy Grove has been quoted by various sources (but will publicly deny) saying that OS/2 is IBM's Vietnam. If the money used by IBM for its marketing efforts were used as grants or loans to software developers, OS/2 would probably have some nice applications by now. Instead, there are a paltry few OS/2 applications available.

Smart spending is not in the cards, as witnessed by IBM's sponsorship of the Fiesta Bowl, among other dubious expenditures. Once IBM realizes what a waste of money the OS/2 marketing program has been, you can be certain it will cut back on R&D and effectively choke the life out of the product.

IBM actually doesn't support OS/2 unequivocally. It

preloads both OS/2 and Windows on most of its machines and will quickly move to Windows 95. Some IBM hardware can't even operate OS/2 efficiently, if at all. Meanwhile, the OS/2 coders have to kowtow to IBM's hardware and software demands. For example, if you check the internal designation of OS/2 Warp, you'll discover that it's called Version 2.3, not 3.0. This is because DB2 cannot recognize the number 3.0, and the software writers were told to use 2.3.

Over time many of the OS/2 superstar coders were relocated (or quit because they didn't want to relocate) from Boca Raton, Florida. Now IBM is suggesting a full pull-out from the Boca site, which has been both a magical place for it and a thorn in its side. It should keep the facility intact and sell it as an independent corporation in the same way it handled Lexmark. IBM can maintain a minority shareholder interest if it fears ridicule from selling off something that later becomes a success.

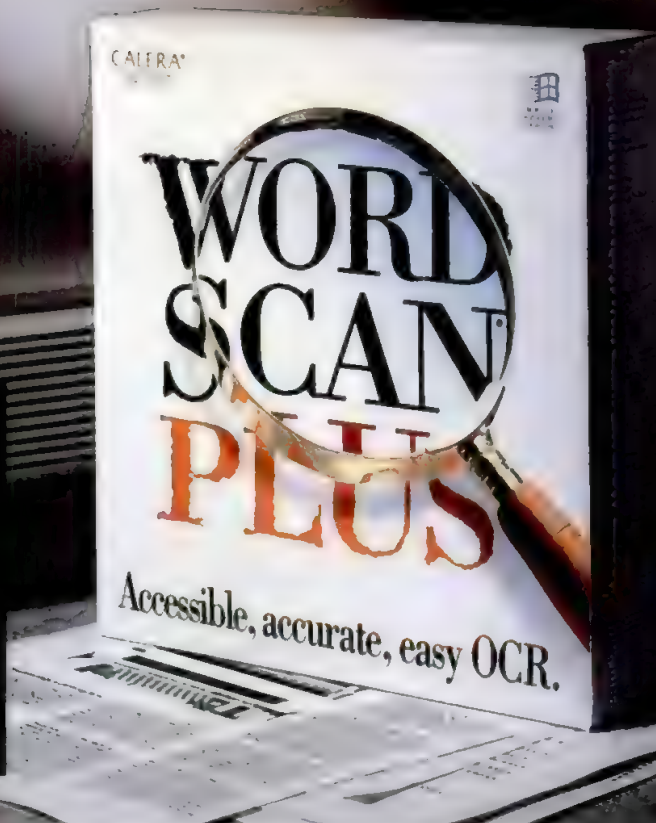
Microsoft is about to flood the market with Windows 95. From the hoopla and fake promises surrounding Windows NT to the eternal delays of Windows 95, IBM has had a bay window of opportunity to take over the operating-system market but has failed to capitalize on it. If Windows 95 turned out to be the turkey of the decade, it would make no difference because IBM's OS/2 would still not be able to fill in the vacuum.

The situation is made worse by the adamant OS/2 users themselves. These people are getting paranoid, flaky, and weird. They remind me of the hopeless Amiga fanatics who "know their system is the best" and believe that everything is a plot against them. OS/2 needs to be put in the hands of a younger, hungrier group of go-getters and visionaries, and this means spinning it off as a separate company. The sooner the better.



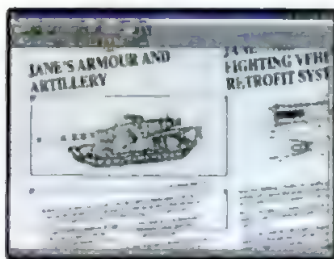
*The problem is that
IBM itself is a hindrance
to the success of OS/2.*

✓ Ultra-fast typist.
 ✓ Microsoft Office
 compatible.
 ✓ Highly accurate.
You're hired.



Introducing WordScan Plus 4.0.
 Award-winning OCR software that's
 closely integrated with your favorite
 business applications.

■
 Your search for the ideal office assistant is
 over. WordScan® Plus is like a Windows-
 savvy, 1500 wpm computerized typist
 who's always on call. It reads each
 character of a scanned
 memo, report or fax with
 incredible accuracy. (With
 Hewlett-Packard scan-
 ners, WordScan Plus uses
 AccuPage 2.0 technology
 to enhance accuracy even
 further.) Then you can
 make edits in your word
 processing program. No
 time-consuming word-by-word retyping
 necessary. ■ WordScan Plus integrates



*Integration with your applications and
 great accuracy make WordScan Plus
 your OCR choice.*

seamlessly with the most popular Windows
 applications. The Chameleon Toolbar™
 takes on the look and feel of Microsoft
 Office, Lotus SmartSuite and Novell
 PerfectOffice. Full OLE 2.0 support
 makes OCR drag and drop easy.
 And One-Button OCR™ recognizes text
 without ever leaving your word processor.

■ WordScan Plus straightens pages
 skewed up to 10°, automatically orients
 documents correctly and
 even defers OCR pro-
 cessing for another
 time. Add in a Pop-Up
 Proofer™ and Language
 Analyst™ for added
 accuracy on degraded
 documents, and award-
 winning WordScan Plus is your perfect
 office assistant.

UPGRADE
 your HP ScanJet
 OCR software! Only
\$149*

*from any version of WordScan,
 OmniPage or OmniScan SE, including the
 OCR bundled with your HP scanner.*

Get these powerful new features:

- 40% higher accuracy — new Adaptive Recognition Technology™ engine
- Pop-Up Proofer™ makes verification faster and easier
- Recognize faxes directly from WinFax PRO, PROCOMM Plus and others
- Select up to 99 zones per page to OCR
- Microsoft Word button for one-step processing

*Suggested price

Call 1-800-535-SCAN ext. 175



WordScan Plus.
Accessible, accurate, easy OCR.



Caere, the Caere logo, WordScan, OmniPage and OmniScan are registered trademarks of Caere Corporation. Chameleon Toolbar, One-Button OCR, Pop-Up Proofer, Language Analyst and Adaptive Recognition Technology are trademarks of Caere Corporation. All other registered trademarks and trademarks are property of their respective companies. © 1995 Caere Corporation. All rights reserved.

CIRCLE 245 ON READER SERVICE CARD

John C. Dvorak Inside Track

The **secret war** between **Intel and Microsoft** is heating up and will affect us all. If you haven't noticed from carefully monitoring the Microsoft **propaganda**, let me tell you that the **promotion of Windows NT** has begun anew.

On the surface, it looks as if Microsoft realizes that Windows 95 will be a popular consumer product but not one for businesses. Windows NT, on the other hand, is the perfect migration path for several reasons, not the least of which is the minimal training expense to get people up and running on the system. That's why Microsoft kept the old interface. It looks and feels like Windows 3.1, while Windows 95 looks and feels totally different.

Businesses prefer **slow change**, and Windows NT is designed so you can pop off the graphical interface and drop in a Win 95 or OS/2 PM interface with ease. Corporations like to make such choices at their own pace.

Let's stop here and discuss the real reason for the NT push. Fact is, Microsoft senses that Intel is about to make a move on the entire business, and Windows NT is a portable operating system that can be moved to any platform if Microsoft somehow gets locked out by Intel when **Intel brings out Intel-brand machines**—and eventually its own operating system. Hear this out.

Remembering that Windows NT runs on non-Intel platforms, and that server technology usually comes to the desktop shortly thereafter, Intel can't be too pleased by **the Microsoft threat**. So Intel has recently, and with little fanfare, **pulled off a coup** that will **stun the industry** late this year, almost completely **cornering the market for memory chips**. It intends to use these chips to populate high-end Pentium and P6 motherboards of its own making and force users to either buy an Intel OEM system (Gateway, Dell, Insight, or the like) or **pay a fortune** for those chips on the open market.

I talked to NEC (a memory chip producer) about this, and even it will have trouble getting memory chips, as Intel has a contract for most of its production. Only IBM and Micron are left free and clear, as they can supply themselves with memory. But Micron makes only Intel-based computers, so **Intel doesn't care**. IBM seems content to target its own foot for its marketing bullets, so it will not pose a threat to Intel. Anyone who is even a **remote threat** will be caught in a market where there is no memory.

In a secondary **warlike action**, Intel has targeted the CPU chip cloners: AMD, Cyrix, and Texas Instruments. As those companies struggle to get a Pentium clone out

*Windows NT is a
portable operating
system that can be moved
to any platform
if Microsoft gets locked out
by Intel when Intel
brings out Intel-brand
machines—and
eventually an Intel OS.*

the door, most are keeping their coffers stuffed with cash by selling 486 chips. Intel has gone to its customers and broadly hinted that if they want Pentium chips in the fourth quarter and throughout 1996, then they had better **cease production of all 486 models** lest they be put on a strict allocation for Pentiums. Now that Intel has its act together with Pentiums, **it wants to kill the 486 market completely**, even though at this writing the 486 is still the most famous computer chip ever produced and still the most popular chip on the market.

One computer manufacturer told me that it's frightening when the Intel sales reps come calling because "They tell you what they are going to let you do, and they make it clear

you'd better do it!" Ah, the joys of no second source! So **look for a tremendous de-emphasis of 486 machines** by the major computer makers: Dell, Gateway, and the rest who have sold their soul to Intel. Only Compaq and IBM might fight this edict.

The irony of all this kowtowing to Intel is that I believe Intel is planning to do a branded computer in 1996 and eventually compete head-to-head with the same people it now supplies. Everything Intel needs to do this is in place. I'm certain Microsoft is aware of this—hence the defensive strategy. Intel has traditionally denied that it plans to do this, but Intel is already the largest motherboard maker, using as an excuse the premise that this is the best way to get the newest Intel technology into the market fast. And it points at the **threats** from AMD as a reason for the need to take action. More than a few of the brand-name computers are—for all practical purposes—Intel-made (though not branded) machines already. Since Intel does not have the immediate infrastructure to supply the whole world with Intel-branded machines, you can be sure that Intel will continue to supply Dell, Gateway, and Packard Bell with chips or entire OEM boxes for years to come.

But not forever. If any of you think that the expensive "Intel Inside" ads were done to keep people from buying an AMD 486, you may be ignoring the real possibility that the thrust of the entire campaign was **to build public awareness for a brand name**. A brand name that people will soon be confronted with **in the form of a computer**. It will shortly be "Intel Inside and Outside!" I can see the ads now.

It's so ironic that Intel's soon-to-be competitors are already putting the Intel logo, in the form of a sticker, on their boxes and on ads. **What a tour de force of marketing!** And you thought Microsoft was tough. Now consider the **possibility of Intel buying Novell** and what that would mean for this scenario. □

Some people will be able to run Windows® 95 without more memory.



Like David Copperfield and Siegfried & Roy to name a few. But of course they can pull rabbits out of hats, make elephants disappear, and other incredible feats of magic. If you can do that, you'll be able to run Windows® 95 just fine. But if you're a bit more ordinary, you're probably going to need massive memory upgrades! That's because while the typical PC has only 4Mb RAM, you'll need a minimum of 8Mb RAM just to load Windows® 95, and 16Mb to create anything magical at all. But you certainly have a choice. You can call David Copperfield, or you can call for the Viking dealer nearest you.



**VIKING
COMPONENTS**

11 Columbia • Laguna Hills, CA 92656
FOR DEALER NEAREST YOU,
PLEASE CALL:

1-800-643-3255

From Canada call 714-643-7255



Manufacturing tomorrow's products...Today!

- Over 900 Modules, Credit Cards, Upgrade Kits For Everything From Apple to Zenith
- For Work Stations, Desktops, Laptops, Notebooks & Laser Printers
- Lifetime Warranty On All Products •Made in the USA •Guaranteed Compatibility

CIRCLE 239 ON READER SERVICE CARD



Jim Seymour

Fix 'Em or Forget 'Em

This is a crazy business, and no part of it is crazier—or makes me crazier—than today's short product life cycles for PC hardware. Not so long ago, industry insiders and Wall Street types were wondering aloud how we could possibly cope with 18-month

product life cycles. Today it's more like 6 months...and they're still asking the same question.

No one wants to stand in the way of rapid progress—as if we could, without getting steamrolled—but often, this incredibly rapid move from hot new product to the closeout table catches users in the cracks. The rapid advances in video cards, for example, have meant that more than one high-profile vendor has released new cards before its programmers have produced truly stable video drivers for its *last* hot card. Needless to say, the programmers working on those drivers never have a chance to go back and clean up—let alone fully optimize—the drivers for those cards that seemed so flashy just nine or ten months ago, and which hundreds of thousands of PC users may have to rely on for the next three or four years.

But nowhere, I think, do users get caught in such a double whammy from rapid model turnover as in trying to upgrade—or worse, repair—notebook PCs.

Desktops are an easier issue because many of their components are pretty standard. For example, you can still put a new hard disk in your 1984 PC AT or even in a PC-XT from 1982.

But hardly anything in most notebooks is standard. Only a relatively small range of the tiny 2.5-inch hard disks currently used in notebooks have been produced, while many of the early, lower-capacity 2.5-inch hard disks are no longer in stock. And items such as hard disk controllers, display controllers, keyboards, LCDs, and many other critical elements can be difficult or impossible to find. Sometimes, but not often, a rough-fit lash-up is possible, by stuffing something into a notebook that was never intended to go into that model.

The painful answer? Pay

an outrageous repair tab or junk the machine, even though it may be only a couple of years old.

I've received an unusual number of letters lately from readers who've been caught in the "notebook obsolescence trap." Many had machines with failed components that the makers of the notebooks said they simply could no longer supply. Unfortunately for these hapless consumers, the modest portion of the long-since-ended production run that had been stockpiled for repairs was gone.

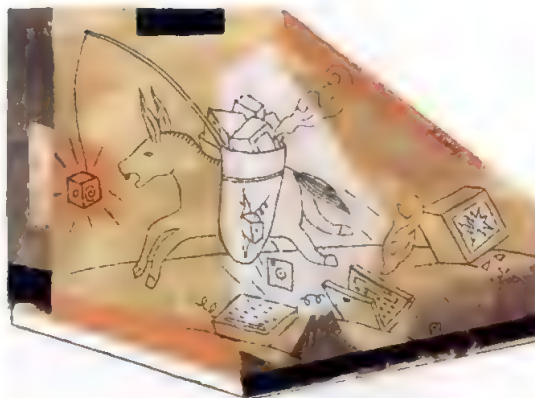
Notebooks often lead pretty rough lives, so we and their makers should expect they'll need repairs more often than typical desktop PCs. But vendors tell me they are actually setting aside *less*, not more spare parts for future repairs. Bottom-line pressure is forcing them to do this, they say; they just can't afford to stock those parts for very long. Unless, of course, they charge us what even they admit can be horrendous prices when we need those repair and replacement parts.

My sister-in-law Jen recently got caught in this snare. Her notebook—a very nice machine from a major U.S. maker, at the top of the line two years ago when she got it—had died. The vendor has a great reputation for customer service, so she didn't expect any problems. Little did she know.

When the notebook was sent back to the vendor for repair, it informed her that the 40MB hard disk had gone south. Replacement cost: \$380.

She was stunned. How could a 40MB drive cost almost \$400 to replace, she asked, when today I can buy a 2.5-inch Seagate with ten times that capacity for about the same amount?

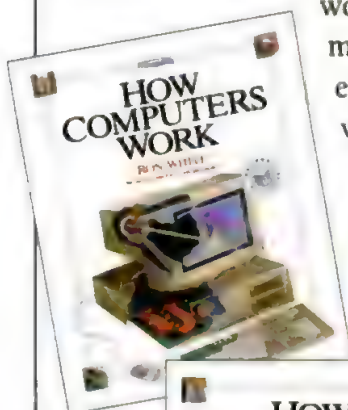
Ahh, she was told, we're actually giving you quite a bonus here. Those old 40MB hard disks we used to use are unavailable, but for



Nowhere do users get caught in such a double whammy as in trying to upgrade notebook PCs.

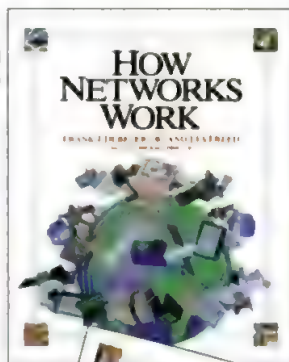
Imagination. Innovation. Insight.

No other books bring computer technology to life like the *How It Works* series from Ziff-Davis Press. Lavish, full-color illustrations and lucid text from some of the world's top computer commentators make *How It Works* books an exciting way to explore the inner workings of PC technology.

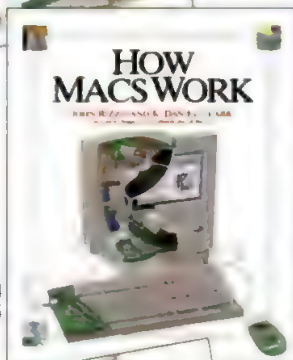


ISBN: 094-7
Price: \$22.95

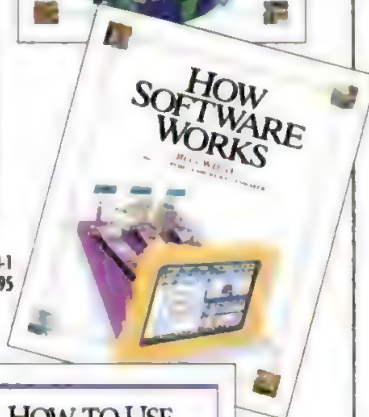
ISBN: 129-3
Price: \$24.95



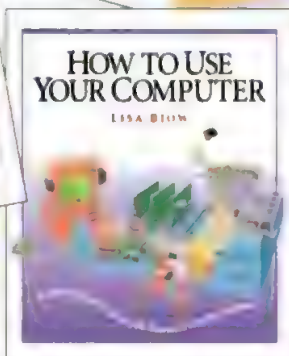
ISBN: 146-3
Price: \$24.95



ISBN: 133-1
Price: \$24.95



ISBN: 166-8
Price: \$15.95



ISBN: 155-2
Price: \$22.95

**AVAILABLE
AT ALL FINE**

**BOOKSTORES OR
CALL 1-800-688-0448, EXT. 8367**

Jim Seymour

your \$380, we're going to give you one *twice* the size: 80MB.

Those other, high-capacity drives so widely and inexpensively available today? They won't work with the notebook's disk controller. But if it's a big issue, the vendor could replace *that*, too, for just another. . . .

She nearly junked the machine. But it was too useful to toss, and in the end, since she'd been bringing her own machine to the office, her employer agreed to pick up the tab. The notebook is back now, working fine (with that huge 80MB hard disk), and she's learned an expensive lesson.

YOU'RE NOT ALONE

Jen's experience is echoed in many of those readers' letters. Break an active-matrix display (or just have enough of the transistors on it burn out that you get tired of looking at a patchwork screen), and you're in really deep water. Many vendors charge well over \$2,000 to replace one—about three times the cost of the part—if it's available at all.

Replacement parts often take strange routes during their lives in vendors' inventories. As models age, IBM begins selling parts such as plug-in hard disks and extra batteries for its ThinkPads at deeply discounted prices through its mail-order outlet operation in North Carolina. After a while, these accessories are given repair-parts-only status and are sold at far *higher* prices.

Curious, no?

I think there are three morals to this story. First, be realistic in your expectations for the useful life of a notebook PC. Technological obsolescence aside, the combination of greater wear and tear and expensive repairs means you may not get more than two years of cost-effective use from a machine.

Second, buy any user-replaceable accessories such as batteries, swappable hard disks, docking stations, and unusual options shortly after you acquire a notebook, if not at the same time you buy it. They simply may not be available at a realistic price later.

Finally, if a notebook develops a problem or simply stops working, don't set it aside and muddle through with a temporary machine for a while. Timing can be critical: What might have been fixable at an affordable price a month or two ago may not be practical, or even possible, today.

Ain't progress wonderful? □





Bill Howard

When the Bits Hit the FAN

You just bought a Pentium/90 for the home, your old 486DX/33 is still too valuable to give to charity, and most nights your spouse brings a laptop home from work. You have a three-year-old LaserJet and you just bought a color ink jet so you could get

home from work a little earlier and print out transparencies for tomorrow's presentation while you sleep.

What does this three-PC, two-printer family need? A LAN, or more properly, a FAN—a *family area network*. I'm convinced this is one of the hottest coming trends in computing. The multiple-computer family exists today for a couple reasons. Rapid technology advances make any computer more than a year old unsuitable as a serious multimedia machine. And many households find there's an after-dinner crunch when several people want to use the computer for homework, office work, or game playing. You need some way to link all those computers and printers that's more sophisticated and immediate than LapLink or sneakernet.

Setting up a network at home is pretty simple.

You'll need *networking software*. Your best choices are Windows 95, Windows for Workgroups 3.11, or LANtastic. Windows 95 will be the easiest to set up and use; LANtastic is the most powerful, but it's overkill in the home. I'd go with Win 95.

You'll need *Ethernet cabling*. Get *Category 5 unshielded twisted-pair cable* (UTP, also called 10Base-T), which looks like high-quality telephone wire with RJ-45 jacks (like RJ-11 phone jacks, only bigger).

You'll need *network interface cards* (NICs), one per PC, \$75 to \$100 for the standard 10-Mbps ISA card. You don't need the \$250 10/100-Mbps cards. For portables, a PC Card NIC is faster and more compact than an external parallel port adapter.

And you'll need a simple *hub*, a \$150 to \$200 device that is a central connecting point for the network cable coming from each PC. You could avoid the cost of a hub by using thin coaxial cable (also called 10Base2 or thinnet), which looks like skin-

ny cable-TV wire. You string it from computer A to computer B to computer C, but it's fragile, and like a set of cheap Christmas-tree lights wired in series, if any part of the network gets knocked off the air, the whole network goes down.

Right now wireless LANs are a bit pricey, but in a year or two they'll be economically feasible for home use. This means the teenager will be able to work in a room apart from Mom and Dad. I also believe the home network may well have a file server two years from now. And there'll probably be a networked PC in the kitchen, a single box on the counter where today you have a phone, an answering machine, the security system control panel, and a nine-inch TV. The kitchen PC will do all those things, and it will also act as a telephone PBX, allowing each room in the house to be its own extension and call any other room.

Here are a couple suggestions if you're remodeling or building a new house. If you're not sure what kind of cable to install, or where, have the plumber run a 1.5-inch pipe from basement to attic. You can easily thread all manner of network and cable-TV cable through with minimal hassle. (For safety reasons you shouldn't run electrical wire through the same pipe.)

If you're lucky enough to be building new or completely gutting a room, when the walls are open, drill a hole through each wall stud and loosely loop through the room every kind of cable you might need in the future—Category 5 network, cable-TV coax, phone wire. Then whenever and wherever you decide to put in a connection (it can be a wall jack just like a phone jack), you just punch a small hole in the wall, fish out the wire, add a connector, and you're in business. While the kids watch TV, you can browse the Internet. It's one way to keep the family together in the 1990s. □



Networking plus home office—the two hottest trends in computing—equals the family area network.

AGFA COLOR
SCANNERS



It faithfully took you to

the mall, the drive-in and

the office. But now it's

time to part. And the sooner you can sell, the sooner you can buy. So you post an ad

with a picture file on the Internet. To make sure everyone can see how beautiful your

baby is, you scan the photo with your Agfa scanner. It captures the color perfectly and

the detail impeccably. Which is why you also use it to scan in the map that's going to

make your international sales report look

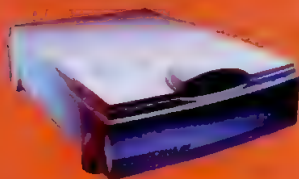
like gangbusters. Who knows? It could

help you get one of those executive

parking spaces for your new baby.



*The new
StudioScan IIsi.*



Because every scan is important.
Comes complete with Adobe
Photoshop™ LE, OmniPage Direct®
OCR Software and Agfa FotoFlavor™
and color management software on
CD-ROM. For the dealer nearest
you, call 1-800-685-4271 ext. 3025.

AGFA and the Agfa rhombus are registered
trademarks of Agfa-Gevaert AG. OmniPage Direct
is a registered trademark of Caere Corporation.

CIRCLE 078 ON READER SERVICE CARD

AGFA 

The complete picture.™

NETWORK EDITION

BBS SOFTWARE

An On-Line Service Of Your Own

Maybe your company needs a more traditional approach to on-line access.



By Les Freed

Does your company need to establish an on-line presence to get information to your customers? Could you use e-mail and file-transfer services to connect your road warriors to one another and to the main office? Could your company make use of an on-line customer-support center?

If you answered yes to any of these questions, one of the solutions you'll want to look into is setting up a corporate computer bulletin board system (BBS). BBSs have been

INSIDE



We talk a lot about how important it is for your company to get on-line. Most of the time we mean getting connected to the Internet or to a commercial on-line

service. This issue, we get back to on-line basics. We asked Les Freed, on-line veteran and author of several books on communications and connectivity, to give us an update on the BBS market.

BULLETIN BOARD SYSTEMS have come a long way, says Freed, who looked at the latest versions of three leading BBS software packages—PCBoard, Wildcat!, and Worldgroup. BBSs remain a great option for companies that want to make things available to customers and employees on-line but don't need the expansiveness of the Internet. Going with a home-grown BBS also helps you avoid the potential security risks of situating a server on the Internet. Moreover, each of these packages provides you a route to the Internet when you're ready.

FIRST LOOKS staff editor Mike Ryan has put together another great section. We start off with a look by *PC Magazine* contributing editor Steve Rigney at a couple of CD-ROM server solutions. Rigney found Microtest's DiscPort Tower to offer excellent management and solid NetWare integration, while SciNet's CD-System is easy to install and doesn't require NetWare.

SENIOR TECHNICAL ANALYST Ryan Tabibian takes a look at Intel's latest release of ProShare and finds its H.320 videoconferencing support strong but loosely integrated. Frequent contributors Greg Alwang and Tony Pompili surveyed some new network management products. Alwang compared the 5.0b release of the popular Saber LAN Workstation with McAfee's BrightWorks 2.01. Pompili found Symantec's new Norton AntiVirus very powerful but a little tough to manage.

—Gail Shaffer

"The Ultimate SMP Pentium Server Solution"

In PC Magazine's latest Service and Reliability survey, Micron received the highest scores in all four categories: Satisfaction with Reliability, Satisfaction with Repair Experience, Satisfaction with Technical support, and Future Likelihood of Buying. (PC Magazine--January 10, 1995.)



	RELIABILITY	REPAIR	TECH SUPPORT	BUY AGAIN
MICRON	9.0	8.8	8.7	8.7
DIGITAL	8.2	7.8	7.9	6.6
GATEWAY	8.6	8.0	7.4	8.2
DELL	8.4	8.0	8.1	7.8
IBM	8.2	7.6	7.4	8.5
COMPAQ	8.4	7.7	7.7	7.4
HP	8.4	7.8	7.7	7.1



POWER SERVER SMP

Only Micron can deliver server solutions built on such a unique heritage of award-winning speed, performance, reliability and service.

And just like all Micron systems, the PowerServer SMP is engineered to meet the challenge of your most demanding information processing needs—with no compromise in system reliability. All PowerServers feature the latest in Intel's Pentium processor technology, paired with Micron's American-made RAM to give you an ideal combination of speed and ample memory. And no server would be a server without



Novell's rigorous lab tests. Certification that the PowerServer SMP is ready to run NetWare® when you are. Plus all Micron products are backed with a 30-day, money-back guarantee with no questions asked. Period.



So it's no surprise why customers surveyed by both *PC World* and *PC Magazine* said they are more likely to purchase a Micron system again than any other manufacturer.

The P90 PowerServer SMP from Micron. An incredible server at an amazing price. Only from Micron, the technology leader.

P90 POWER SERVER SMP

- Intel 90MHz Pentium processor
- Dual Pentium SMP ZIF sockets
- 512K write-back cache, Flash BIOS
- Slots: 5 EISA, 2 PCI, 1 EISA/PCI
- PCI 32-bit Fast SCSI-2 controller
- 4X SCSI-2 CD ROM drive, 3.5" floppy
- PCI 64-bit graphics accelerator (2MB)
- Full-size tower with 10 drive bays
- Microsoft Mouse, 101-key keyboard
- MS DOS & Windows for Workgroups



- A**
- 16MB RAM
 - 1GB SCSI-2 hard drive
 - 14" Micron 14FGx, 1280NI, .28mm
- \$3,699** (Lease \$126/month)

- B**
- 32MB RAM
 - 2GB SCSI-2 hard drive
 - 15" Micron 15FGx, 1280NI, .28mm
- \$4,999** (Lease \$170/month)

- C**
- 64MB RAM
 - 4GB SCSI-2 hard drive
 - 17" Micron 17FGx, 1280NI, .28mm
- \$6,999** (Lease \$229/month)



With second 90MHz Pentium processor...add \$799
With Windows NT Workstation CD.....add \$249



Make The Connection
800-388-6334
MICRON
ELECTRONICS, INC.

Micron Electronics, Inc., 900 E. Karcher Road, Nampa, ID 83687
Mon-Fri 7AM-8PM Sat 8AM-5PM (MT)
208-463-3434 • FAX 208-463-3424 • Purchase Order FAX 208-467-5384

© 1995 Micron Electronics, Inc. All rights reserved. All prices and specifications subject to change without notice. Micron Electronics, Inc. cannot be responsible for omissions and/or errors in typography or illustrations. PowerServer is a trademark of Micron Electronics, Inc. Intel, Intel Inside, and Pentium are registered trademarks of the Intel Corporation. Microsoft is a registered trademark and Windows, Windows NT and the Windows logo are trademarks of Microsoft Corporation. All other company trademarks are trade names of each respective company. Prices do not include shipping and handling. 30-day risk-free money back guarantee does not include return freight and original shipping/handling charges, applies only to Micron brand products, and begins from date of shipment. All returns require RMA numbers and must be shipped in the original condition prepaid and insured. Lease prices based on 36-month lease.

CIRCLE 924 ON READER SERVICE CARD

with us since the dawn of the PC era. But many people think of BBSs as dark, dank hideouts for teenage hackers, phone phreaks, and other digital reprobates. In reality, a well-run BBS can be a useful, productive business tool. Hundreds of companies run public-access BBSs, and many more use private BBSs as in-house e-mail, conferencing, and file-exchange systems.

The three BBS programs we review here—PCBoard v15.21, Wildcat! 4.1, and Worldgroup Version 1.0—offer attractive alternatives to setting up a World-Wide Web site, an on-line forum on a big commercial service, or a high-end conferencing package, such as Lotus Notes. All three provide e-mail, message conferencing, and file upload and download facilities. Each is highly customizable, allowing you to decide who has access to the system's services.

Your company—like many others—probably has several people who are always on the road. These users are often a company's busiest and most productive employees—and they're often the worst connected. Commercial or in-house e-mail and group conferencing systems provide valuable communications tools to keep the road warriors in touch with the home of-

PCBoard v15.21

The package that has been around the longest impressed us the most in this roundup. PCBoard v15.21 is a very well-priced, yet a very well-heeled—

and mature—BBS program. Clark Development Co. has continually developed its BBS offering into a product that offers an attractive mix of features, versatility, and value.

In addition, Clark has included Internet connectivity features in its base packages that are optional in the entry-level versions of the other packages here. Wherever you go to get on-line, getting connected to the Internet is likely to be something you'll want to try. This package acknowledges that up front.

As relative newcomers to the BBS

market, Wildcat! and Worldgroup have helped create renewed excitement for standalone bulletin boards.

Wildcat! has been very popular, largely because of its good pricing, easy setup, and great messaging capabilities.

Worldgroup, on the other hand, with its move to a graphical world for the client, may be setting the pace for a new generation of BBS packages. Its space requirements tell the tale, though, of what moving into a more graphical world can cost you.



fice and with one another—if your company has the appropriate budget and expertise. For many smaller companies, however, the expense and administrative overhead of these systems outweigh the benefits.

THIS IS REALLY ON-LINE

You can't pick up a newspaper or turn on the TV without hearing about the Internet, the Web, or the "information superhighway." Thousands of businesses worldwide are rushing to make themselves known in

GLOSSARY

BBS Terminology

ANSI terminal The vanilla type of display that adheres to the ANSI standard terminal language (ANSI is short for the American National Standards Institute.) Most terminal emulation and BBS programs use ANSI terminal emulation when a user logs on. If you're calling into a BBS with a general-purpose program such as CrossTalk or Procomm, make sure you select ANSI emulation.

BBS A bulletin board system; a system consisting of one or more PCs, communications links (typically a serial port, phone line, and modem), and a software package that allows users to dial in for information and messages.

BBS node A communications link to the BBS software that allows a single user to dial in to the bulletin board. Many BBS packages allow multiple nodes to reside on one PC or across a network so that many users can dial in at once.

DESQview A multitasking windows environment, from Quarterdeck Office Systems, that lets a user run several DOS programs at once. It is often used to run several BBS nodes on a single machine.

Door A BBS software interface that allows other programs to run under the control of the BBS.

Fido The standard e-mail interchange protocol used to pass messages from one BBS to another. There are even gateways from Fido systems to the Internet.

FOSSIL A driver interface that provides support for multiple-serial-port boards. The BBS talks to the multipoint board through the FOSSIL driver, which makes it possible for you to have 16 serial ports in a single PC with no address or IRQ conflicts.

ISDN Integrated Services Digital Network; a 64-Kbps communications standard for transmitting voice, video, and data over a digital line.

MHS Message Handling Service; a Novell messaging system that supports multiple operating systems and messaging protocols.

On-line service A remote service that provides e-mail, forums, software, news, and Internet access.

QWK A BBS-specific mail-transfer protocol—pronounced *quick*—that allows users to call a BBS, exchange e-mail, and log off quickly. It saves connection time and toll charges and can also be used in lieu of Fido for inter-BBS message passing.

RIP Remote Imaging Protocol; a BBS-to-terminal display protocol that provides the tools to put a graphical user front end onto a BBS, complete with color graphics, icons, and clickable buttons. Callers must have RIP-compatible terminal programs.

Serial port/COM port An input/output socket on a PC that sends and receives data one bit at a time. The BBS connects to the modem via the serial port.

Sysop system operator; the person with the job of maintaining the BBS. A sysop can usually see all messages and files on the system, so be careful when you hand out sysop privileges.

UUCP Unix-to-Unix Calling Protocol; the protocol used—among other things—to move Usenet news feeds around the world. If you want your BBS to be able to ingest Usenet feeds, make sure it supports UUCP.

John McBride
Available Mon 10-12
(MS Windows PC
on TCP/IP)

No Schedule Is An Island

Kate Devereaux
Available Mon 9-12
(Macintosh on
AppleTalk DE'Net)

Dan Falken
Available Mon 9-12
(MS Windows PC
on PATHWORKS)

Tony Stella
Available Mon 10-12
(DOS PC using VINES)

Real-Time Access To Schedules Across Any Enterprise

Can your scheduler handle this?

A meeting of 6 people. From anywhere in the enterprise. Using PCs, Macintoshes & time-shared VTs. Over NetWare, Banyan VINES, PATHWORKS & TCP/IP LANs. In real-time.

Calendar Manager can.

What good is an enterprise scheduler if everyone isn't on-line? It's just one reason over a million people use Calendar Manager to schedule more meetings for more groups, across more WANs, than any other scheduler. Why? All scheduling is real-time, whether on a PC/Windows, Mac or terminal, over mixed NetWare, Banyan VINES, PATHWORKS or TCP/IP networks, across the hall or on a different continent. Advanced group features let users delegate different levels of proxy access to their calendar, and view many people, resources or locations at one time. Real-time access lets users know of a conflict within seconds, instead of minutes for improved productivity.

John Allen
Available Mon 10-12
(VT using ALL-IN-1
and OpenVMS)

CALENDAR MANAGER®

The #1 group scheduler
across the enterprise



The Executive Diary (shown) or Month/Day formats give users access to every feature. Drag-and-drop meetings, names, locations or resources for fast, easy scheduling.

Calendar Manager is a great personal planner, too. Network managers like the true client/server architecture, and no requirements for an e-mail system or dedicated server, which make Calendar Manager easier to manage than other LAN-based scheduling products. According to Byte Magazine, "Perhaps Calendar Manager's strongest attribute is its performance... even a WAN environment won't slow it down." And, a consistent user interface across all platforms makes Calendar Manager easier to learn and support. To connect everyone's schedule across your enterprise, call us.

Laura Daly
Available Mon 11-12
(MS Windows PC
on NetWare)

RUSSELL Information Sciences
Longmont, CO
Hampton, NH
London, England

For more information
on Calendar Manager
call 714-362-4000
or fax 714-362-4040.

cyberspace, fearing that they'll be left behind if they don't do something—anything—soon.

The Web is touted as the best way to establish a cyberspace outpost. Anyone with an Internet connection and a browser such as Netscape or Mosaic can access your Web page for no charge, other than the usual access fees.

That's both the good news and the bad news. On the Internet, *anyone* can access your Web page—even people who have little or no interest in your company's products or services. Further, having a Web page on the Internet requires that you establish a Web server (or that you lease time on someone else's server). This requires a dedicated, high-speed Internet connection, which can cost several hundred dollars a

month. If you're running your own Web site, your system is vulnerable—as is any Internet host system—to intrusion.

Another option for a company seeking an on-line presence is to establish a forum on one of the commercial on-line services, such as CompuServe or America Online (AOL). An on-line forum can be a valuable tool—assuming that all of the people who need to reach you are connected to the same on-line service.

The populist nature of the mega-on-line services demands that public forums have mass appeal. If your company sells specialized products or services, you probably cannot attract enough users to make a public forum economically viable. Even on CompuServe, where establishing such a forum is free, you still must provide constant support.

SOLUTION: YOUR OWN BBS

If you've never dialed into a BBS, think of it as a miniature AOL or CompuServe. A BBS can have public and private message areas, user-to-user e-mail, and file upload and download areas.

A BBS can be as simple or as elaborate as your needs dictate. For example, you can set up a basic single-line BBS with just a PC (an old 386 system will work just fine), a modem, and a phone line. At the other extreme, a BBS might require hundreds of lines, have an Internet connection, and run on dozens of networked Pentium/100 computers.

The original generation of BBS software provided access by modem only. Today's generation is much better connected. But still, all anyone needs in order

A Brief History of BBSs

For those of us who live and breathe electronic communications systems, bulletin board systems often seem like a throwback to the 1,200-bps modem era of the late 1970s and early 1980s. Nevertheless, long before America Online, CompuServe, or Prodigy could claim millions of subscribers, hundreds of independent computer BBSs were up and on-line.

The very first BBS was created in 1977 by Chicago-area microcomputer pioneers Ward Christensen (inventor of the Xmodem protocol) and Randy Seuss. Their CBBS (Computer Bulletin Board System) ran on an Intel 8080 system, modified with a heavy-duty power supply and a few extra fans to keep it from overheating. Storage consisted of two 8-inch floppy disks holding 243K each. Off-the-shelf software didn't exist in those days, so most BBS operators wrote their own BBS software from scratch. Christensen and Seuss's BBS was, in many ways, one of the first entrances to the information highway. Back in 1978, for many users with modems the CBBS was the only place to call.

The arrival of the IBM PC in 1981 put a lot of computers onto a lot of desktops. As the number of installed PCs grew, so did the number of BBSs. Many were merely electronic watering holes, providing free access to callers within the system's local calling area. They were generally funded by the sysops who ran them. When the number of callers mushroomed, many sysops found that their single-line BBSs were permanently busy. As soon as one caller disconnected, the phone would ring again.

A few entrepreneurs took advantage of the BBS boom and set up subscription services. For a small fee, a user could buy a fixed number of hours each day. Some of these grew to hundreds of lines and thousands of

users. Many are still in operation today, such as the Software Creations BBS, which grew from 1 to 130 lines in just four years.

The growth of the major on-line services, such as CompuServe and Prodigy, has put a dent in the pay-as-you-go BBS business. Small-time BBS operators cannot provide the breadth and depth of content found on the big on-line services. Pay-BBS operators have responded by providing specialized services that the big on-line companies cannot, such as BBSs that are strictly game-oriented.

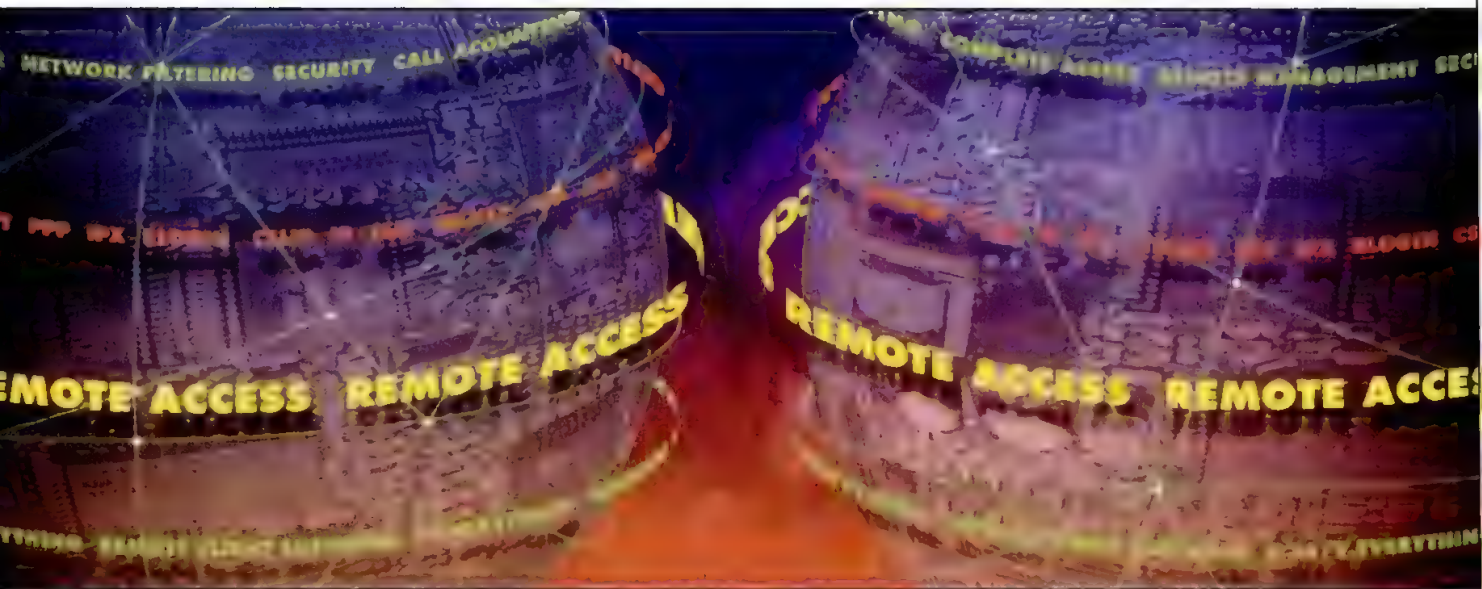
While the era of the commercial BBS may be waning, a new crop of BBSs is on the rise. Many major hardware and software companies operate free customer-support BBSs. The content on these systems varies widely, but a typical one contains a library of software updates and patches, as well as a message area in which callers can interact with the customer-service department. Thousands of other companies operate private BBSs that enable off-site employees to exchange files and messages.

The newest generation of BBS software, represented by the three reviewed programs, is incredibly versatile. All three provide flexible communication options, allowing you to connect via modem, LAN, or Internet telnet connection. They each offer an e-mail gateway to connect the BBS to Novell MHS and Internet POP mail servers, as well as a Usenet gateway. Each is highly customizable, allowing you to change menus and messages to suit your application.

Finally, all three packages provide several canned installation setups to help you get your BBS going with a minimum of effort. You can have any of these three programs up and running within 30 minutes—much better than writing your own BBS program from scratch!—LF



TECHNOLOGY THAT'S BIG ENOUGH FOR THE MCI GLOBAL NETWORK...



AND SCALED TO FIT YOUR LOCAL NETWORK



When MCI asked U.S. Robotics to deliver a dial-up Internet access solution powerful enough to handle hundreds of thousands of users, we responded with a fully integrated solution designed to meet their needs – Total Control NETServer. Now, with the introduction of the 8 and 16 port NETServer, small corporate networks and branch offices can provide mobile users and telecommuters with the same powerful remote access to their corporate LAN.

NETServer/8 and /16 incorporate proven U.S. Robotics V.34 modem technology and NETServer LAN access routing to

provide a remote access solution with the same comprehensive management and security that large service providers, like MCI, depend on.

So, whether you're providing remote access for 10 users or 10,000 users, U.S. Robotics has a remote LAN access solution designed to meet your business needs.

For your solution, call 1.800.USR.CORP, ext. 2100
<http://www.usr.com>

1995 Novell, Inc. All rights reserved. Novell and NetWare are registered trademarks of Novell, Inc.



After struggling within the limitations

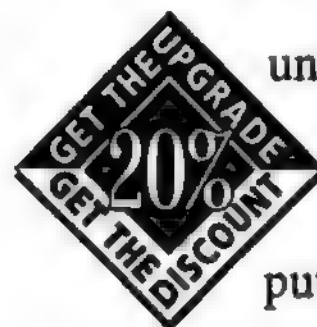
Move the center. As you see fit. • With NetWare® 4.1, you are the single point of administration wherever you go. And no matter where in the world you have network resources, Novell's breakthrough NetWare Directory Services lets you access them all.

• You create users, assign access rights, and manage network services with NDS. It's so easy — just drag and drop. • Our 20% discount makes the upgrade



of centralized network administration, there was only one thing left to do.

decision even easier. Don't miss this chance to save. This offer is good only



until October 31, 1995. • So stop

chasing around your network, putting out fires. Because with

NetWare 4.1, the network revolves around you. • Call your Novell® reseller or 1-800-747-5958 for a reseller near you. Or, for more information, see us at <http://www.netware.com>.

 **NOVELL**



to call into a BBS system is a modem and terminal program—standard-issue stuff for the majority of today's new PCs.

BBS programs also allow users to connect via a LAN, providing in-house users with high-speed access to the BBS. All three programs here provide for Internet telnet access if your BBS is connected to a TCP/IP network (optional with Wildcat! and Worldgroup). They all support ISDN connections (optional with Worldgroup); we were able to get all three to work with IBM's Waverunner ISDN board.

Each also provides an Internet e-mail gateway (optional with Wildcat! and Worldgroup), allowing BBS users to exchange mail messages with any Internet user. And all three have the ability to digest incoming Internet Usenet feeds (optional with Wildcat! and Worldgroup). These features allow you to use the BBS as a sort of private Internet gateway, but without the hassle of providing each user his or her own Internet connection and software.

AN EASIER APPROACH

Installing any of these programs is fairly simple. It's possible to have a BBS up and running 15 minutes after you break the shrink wrap. It will take somewhat longer to fine-tune your installation, though. Each of these packages has literally hundreds of options, many having to do with security and access control.

If you're planning to set up a public-access BBS, consider beginning with one of the canned setups provided with each package and customize from there. If you choose to limit user access to the system, you'll need to create user accounts for each person who will use the system. This can be a tedious process. Fortunately, it's one of those things you usually need to do only once.

Once a BBS is on-line, it requires some maintenance. If you plan to set up a public-access system for customer support or information distribution, you'll need to make it someone's job to keep the BBS up-to-date. There's nothing older than old news, and we've seen many BBS systems (including some run by major software vendors) with out-of-date information. If your service is set up for private access, check the user log periodically to make sure that no unauthorized users have cracked the system.

However you set it up, establishing your own BBS is an attractive alternative to some other approaches to getting your company on-line. It can save you money and time and may just do the trick for your customers and users.

Is Security an Issue? Then a BBS May Be for You

Before you put your new BBS on-line for all the world to enjoy, think about what you're doing. It's a cruel world out there, and there are some people who will try to make your life miserable: We're talking about hackers, crackers, and competitive spies. There's no way to make any dial-up system completely foolproof, but there are a few tried-and-true methods that make it much more difficult for someone to gain access to your data.

The most effective way to safeguard any data is not to put it on the BBS in the first place. If you're setting up a public-access system, run the BBS system on a dedicated computer. Put only the necessary BBS files on the system—files you would give users access to anyway. If the BBS is on a LAN, create an extremely limited LAN account for the BBS software, granting access only to the BBS subdirectory on the LAN. If outsiders manage to get past the BBS security and onto your LAN, the last thing you want to give them is access to a supervisor or other high-level LAN account!

If your system will be for employees only, you have a few more options available. For starters, consider using call-back security. Under this scheme, a user dials into the BBS and provides a user ID and password as usual. After the BBS authenticates the user, it disconnects the line and calls the user back at a predetermined phone number. Callback requires no special hardware, but it does complicate the process of connecting to the BBS.

The callback approach works well for work-at-home users, especially for those who may have to make long-distance calls into the BBS. It doesn't work well for highly mobile users, since they may be calling in from anywhere.

Most BBS programs can handle a mix of callback and normal dial-up users.

Also check to see whether Caller ID is available in your area. If it is, you can

equip the BBS with Caller ID-aware modems. You can program these modems

to answer calls only from specific telephone numbers.

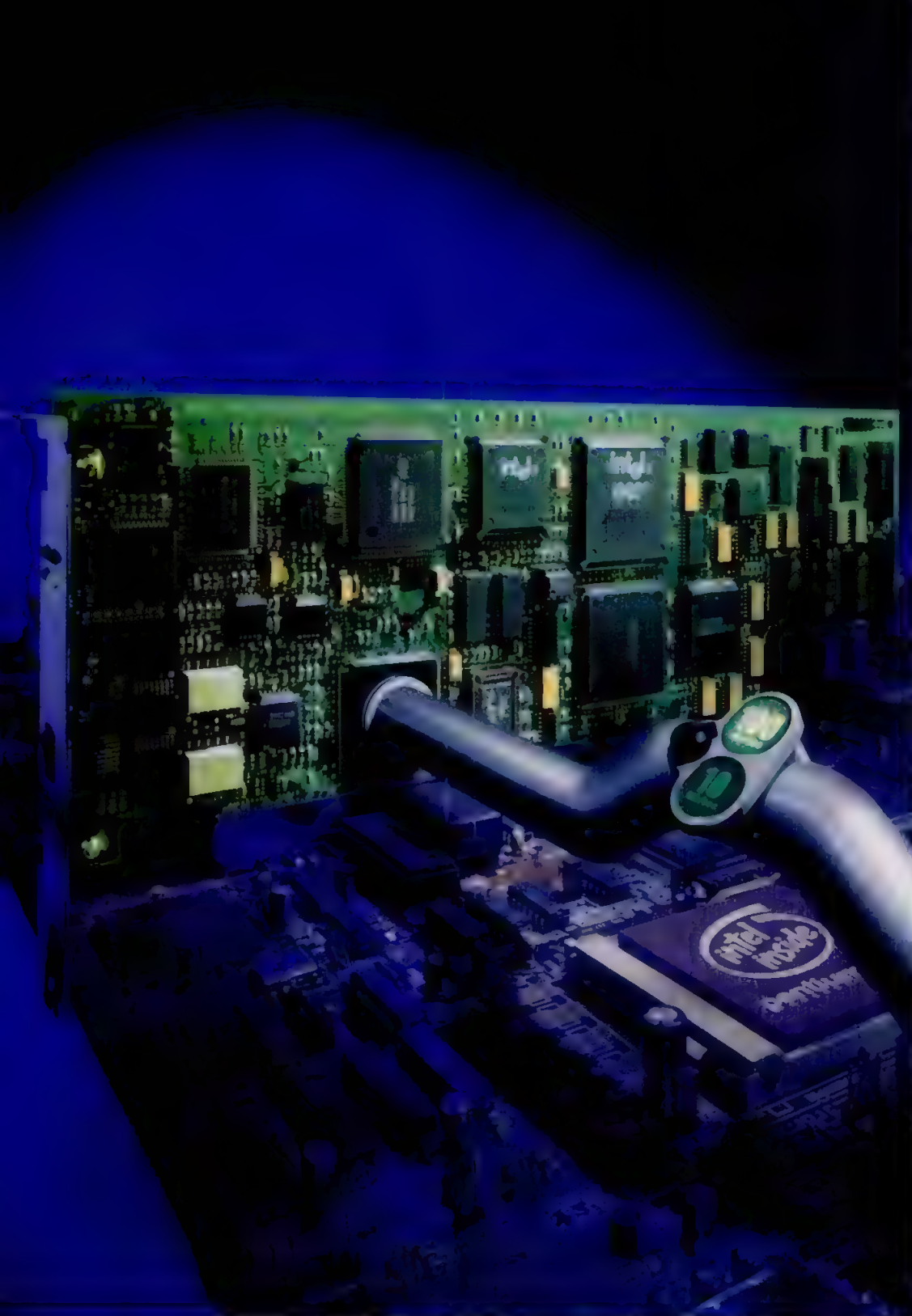
Like callback, though, this can be a hassle if you want to make the

service accessible to highly mobile users.

If you have a large group of home-office types, you might consider installing ISDN lines in their homes. ISDN charges vary widely nationwide, but in most cases an ISDN line doesn't cost much more than a normal phone line. ISDN provides 64-Kbps of data throughput, and an ISDN line can handle two calls at once. Keep in mind, however, that most local phone companies charge ISDN calls by the minute—even local calls.

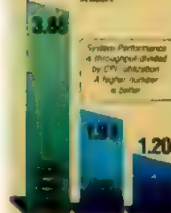
Many hackers discover private computer systems by dialing numbers at random and listening for modem answer tones. ISDN lines don't answer with unique tones, so they don't give themselves away. In addition, even if a hacker does get the number to your BBS, he or she would have to have an ISDN line and an ISDN PC interface to gain access—still not an easy thing to get installed.—LF



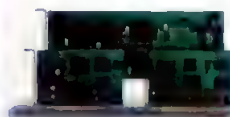


TAKE CONTROL
—of—
YOUR NETWORK

Performance/Efficiency
Index*



**Intel EtherExpress™
PRO/100 adapters.**
Maximum throughput with
minimum CPU utilization
means better system
performance for today's
demanding applications.



Our family includes
10/100 PCI and EISA
cards and our new
PRO/100 Smart Adapter,
the industry's first
intelligent 100Mbps PCI
adapter designed for
Pentium® processor-
based servers.



<http://www.intel.com/>
Order a PRO/100
evaluation kit and see
how fast your network
can be. To learn more,
visit our Web site or call
1-800-538-3373, ext. 153.

© 1995 Intel Corporation. *Average throughput/CPU utilization with 5 nodes

Only Intel Fast Ethernet adapters
go beyond throughput to improve
overall system performance.

intel®

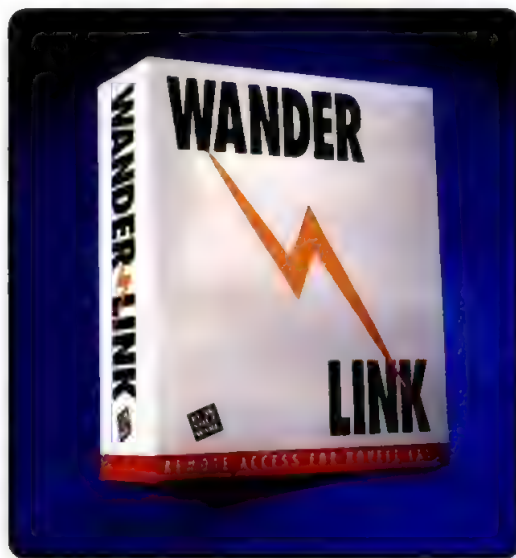
Remote access for NetWare. Real fast. Real secure. Real simple.

Sure, there are lots of remote access solutions for Novell networks out there. But if you do some homework, you'll find that new server-based, software-only WanderLink just raised the bar in terms of performance and security.

Network managers, you'll be impressed with WanderLink's easy installation, manageability, and airtight security. And anyone in your company that works at home, on the road, or out of a branch office will love the fact that WanderLink gives you both remote node and remote control at phenomenally fast access speeds.

NO HARDWARE INCLUDED

WanderLink runs as an NLM right on your NetWare file server, and can operate standard modems using the



REMOTE NODE PLUS REMOTE CONTROL

Before WanderLink, you had to choose between mutually exclusive options.

You could choose a remote node solution to let users directly connect to the LAN over phone lines — the perfect

choice for tasks like reading email or editing documents. Or, you could opt for remote control to let users take over and operate a PC at work — the better choice for jobs that move large amounts of data over the network, such as database queries.

But, with WanderLink, you don't have to choose. You get remote node, plus powerful remote control for Windows that lets you operate any network PC at amazing speeds, right over your remote node connection.

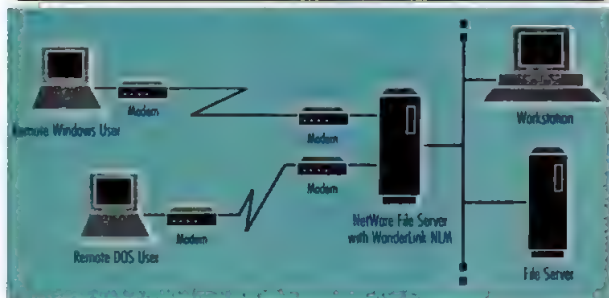
BLAZING DATA

WanderLink compresses the data it sends over the phone line, so you can work at top speed. And, since compression is done in software rather than in your modem, baud-rate bottlenecks are eliminated and throughput can increase dramatically. Plus, a special Virtual Device Driver (VxD) ensures that access from Windows is just as reliable as it is from DOS.

IRON CLAD SECURITY

One last thing you get from WanderLink and nowhere else — peace of mind. In fact, you'll probably sleep better knowing that WanderLink has enough built-in security to confound the CIA, and maybe even scare off a hacker or two. Nothing is more secure.

Turn any NetWare file server into a remote access server with WanderLink



server's serial ports or a serial multiplexer card. All the hardware you need is off-the-shelf, and most of it you probably have already.

It's also amazingly easy to install. And you can administer WanderLink from any Windows PC on the network.

Only WanderLink gives you this much security

Password Protection lets you authenticate users with a secure challenge-response mechanism.

Restricted Dialback lets you force dialback to a pre-determined phone number for any user.

NodeID lets you control access by fingerprinting the PCs that users may dial in from.

Domain Filtering lets you limit the networks and nodes visible to any user to create packet-level firewalls.

Data Encryption lets you guarantee the privacy of your communications with Diffie-Hellman key agreement and RC4 Encryption from RSA Data Security, Inc.

For more information call:

1-800-828-4146

Ext. 950



Try WanderLink for yourself! Call today for your FREE demo disk!

© Copyright 1994 Funk Software, Inc. All rights reserved. WanderLink and NodeID are trademarks of Funk Software, Inc. WanderLink is licensed based on number of dial-in ports on the server. The WanderLink Client can be distributed freely. For each licensed dial-in port, one WanderLink Remote User Pack containing one Remote Control Master and Host license is also included. Additional Remote User Packs are available separately. Funk Software, Inc., 222 Third Street, Cambridge, MA 02142 • Tel. (617) 497-6339 • Fax (617) 547-1039 • <http://www.funk.com>

CIRCLE 870 ON READER SERVICE CARD

Clark Development Co. Inc.

PCBoard

ALL REVIEWS BY LES FREED



First released in 1983 and currently in its 14th major revision, PCBoard is the granddaddy of commercial BBS packages. Its maturity shows in its complete \$150 two-user package that provides LAN support, a FIDO mailer, a QWK mailer/reader, and an Internet UUCP gateway.

PCBoard v15.21 is also the most expandable of these three packages, supporting up to 65,535 nodes (1,000 when purchased off the shelf) using a network of computers with up to 16 nodes running on each PC.

If you do run more than one node on a PC, you will need a multitasking operating system. Clark Development recommends DESQview or OS/2, but we had no problems running a 4-node system in four DOS sessions using the final beta of Microsoft Windows 95.

Making a LAN connection to PCBoard is incredibly simple. You map a drive to the LAN directory that contains the PCBoard software and run the pro-

gram. You'll see the BBS just as you would over the phone, but at warp speed. You can also monitor and maintain the BBS from anywhere on the LAN—a nice feature if the BBS host is some distance from your desk.

PCBoard works with virtually every multiport serial board on the market and is compliant with the FOSSIL multiple serial-port driver spec. PCBoard also supports ISDN boards that ship with OS/2 device drivers or that mimic standard COM ports. It worked well with our IBM WaveRunner board, which it recognized as a serial port.

This package also works with all the major LAN operating systems, including LANTastic, Microsoft Windows NT Server, NetWare, and VINES. We tested PCBoard on a mixed NetWare/Windows NT Advanced Server LAN with no LAN-related problems.

PCBoard also addresses international audiences by including support for double-byte alphabets, such as kanji, and for right-to-left languages, such as Hebrew. Clark maintains a library of language files that is free to PCBoard users.

PCBoard's security and user accounting are exemplary. Because it is very popular among the pay-BBS operators, the program includes a variety of billing and user-

tracking options. When you install PCBoard, the installation program asks you what type of BBS you want to install, and then sets the billing and accounting options automatically.

In the security arena, Version 15.21 has the new Shared Secret Logins feature, which prevents hackers from infiltrating your BBS's Internet gateway. TCP/IP packet sniffers are no longer able to discern passwords when monitoring your communications.

You can choose from the Technical Support BBS, Sales BBS (for taking orders on-line), Corporate BBS (a closed system primarily for e-mail and file transfer), or Hobby BBS (with optional by-the-click billing). If none of these options suits your needs, you can use one of the setups as a starting point and customize the system from there.

PCBoard's combination of features, price, and flexibility is hard to beat.

PCBoard v15.21. List Price: For 2 nodes, \$150; for 5 nodes, \$250; for 10 nodes, \$350; for 25 nodes, \$550; for 100 nodes, \$950; for 250 nodes, \$2,500; for 1,000 nodes, \$7,000. Clark Development Co. Inc., Murray, UT. 800-356-1686, 801-261-1686; fax, 801-261-8987; demo BBS, 801-261-8976; e-mail, sales@clarkdev.com.

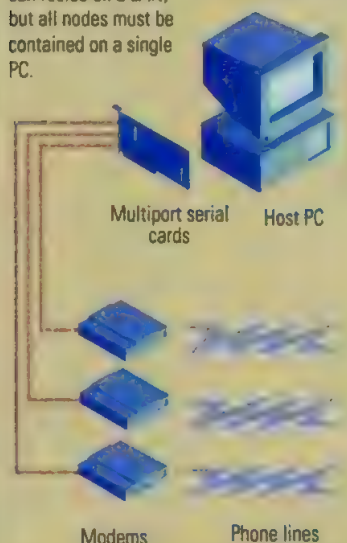
Circle 951 on reader service card

How to Configure Your BBS Host

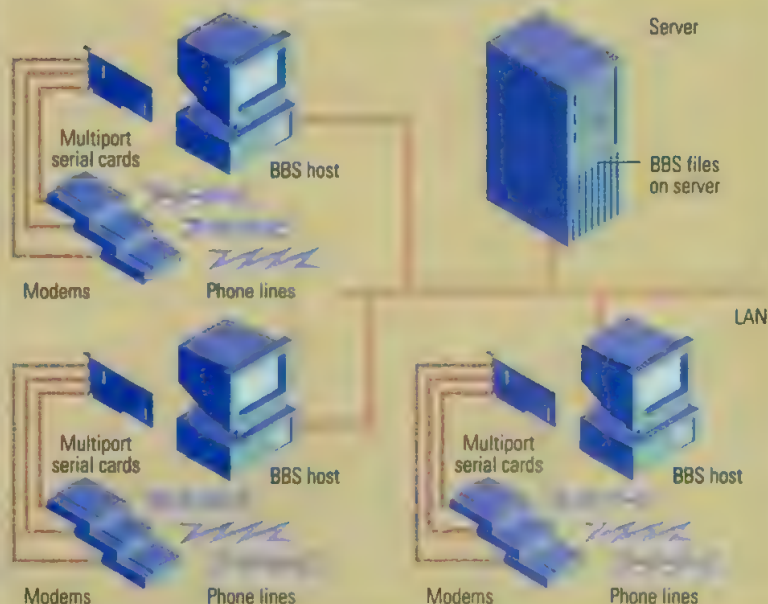
For Worldgroup

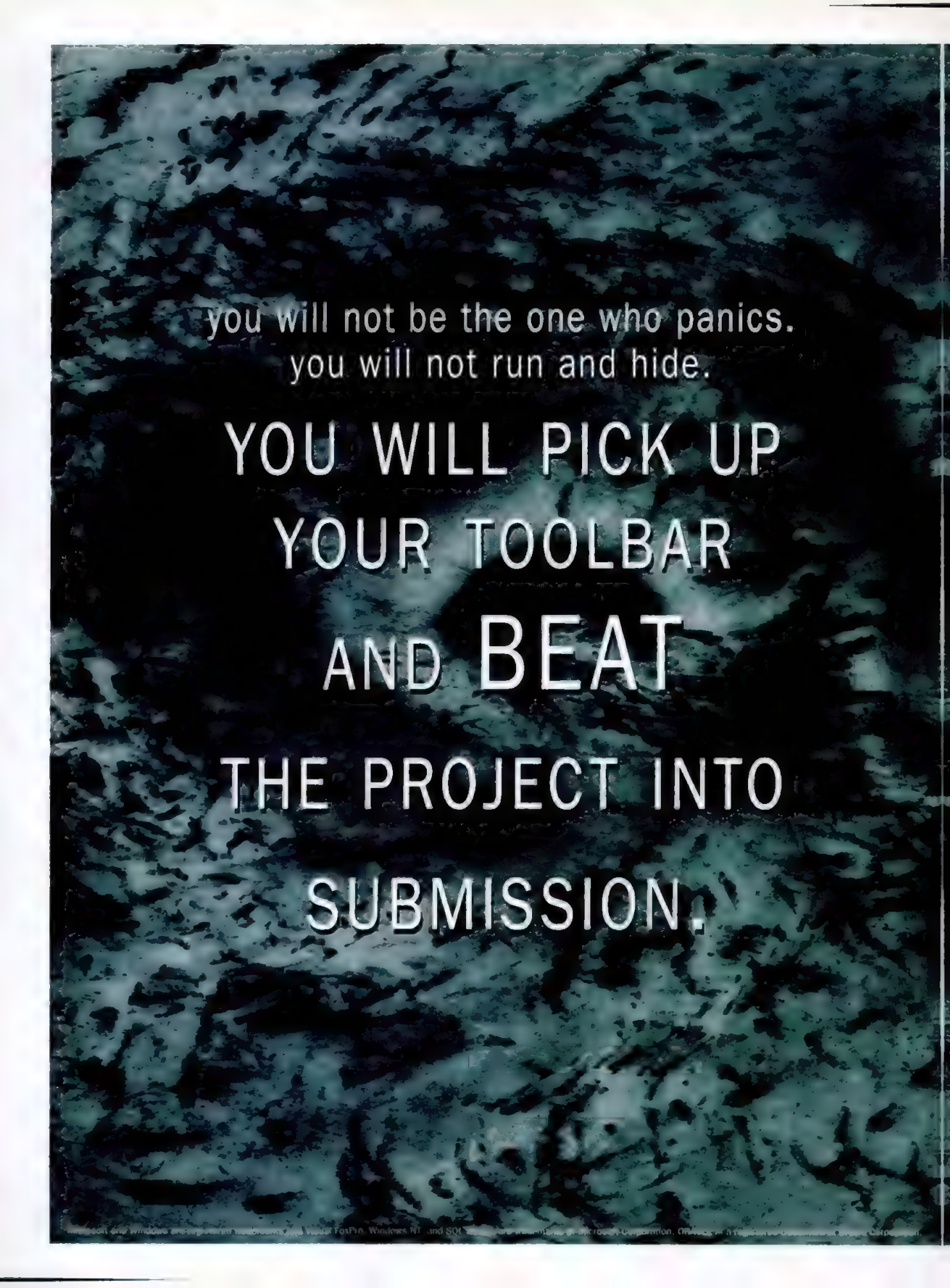
The Worldgroup host can reside on a LAN, but all nodes must be contained on a single PC.

256-user maximum



For PCBoard and Wildcat!





you will not be the one who panics.
you will not run and hide.

YOU WILL PICK UP
YOUR TOOLBAR
AND BEAT
THE PROJECT INTO
SUBMISSION.

Visual means you work faster, think faster, develop faster. Now as an Xbase developer, you can work with toolbars, pre-existing objects, and an arsenal of visual controls that automate hundreds of tasks without sacrificing an ounce of database power.

RAPID APPLICATION DEVELOPMENT DEFINED

Instead of working only with code, you work in



an environment that allows immediate, graphical access to all the files, tables, objects and classes in your application. Working visually, you become the embodiment of rapid application development.

OBJECTS = OBJECTIVITY

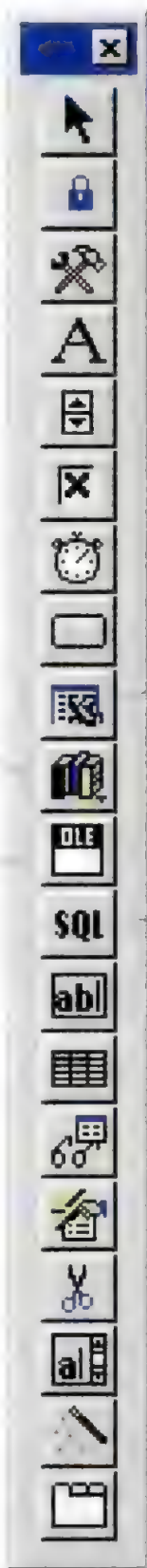
With Microsoft® Visual FoxPro™ 3.0 Database



Development System for Windows,* you can work intuitively, creatively, building applications out of reusable classes that support inheritance and encapsulation.

Because you can access OLE controls and custom controls right from your toolbar, you work faster than ever.

Click on the OLE button and you can leverage the data and functionality residing within Microsoft Office applications as an existing component. Modify and run a Microsoft Excel



(The Toolbar)

spreadsheet "in place" from within your new Visual FoxPro application.



CLIENT-SERVER SERVED

Visual tools and enhanced connectivity let you build client-server applications that connect to the most popular database backends. Using 32-bit ODBC drivers, you can integrate data from client-server databases, local data stores, and from inside applications like Microsoft Excel. And a built-in wizard lets you easily upsize your local data to Microsoft SQL Server.™ Block-by-block, you build applications that combine a graphical user interface with the speed, data storage and security of backend databases like Microsoft SQL Server and ORACLE.*



And yesterday's applications can be leveraged or updated to the most advanced 32-bit platforms like Windows NT™ and the new Windows® 95 operating system, as well as 16-bit Windows. Visual FoxPro 3.0. To get it, see your reseller, or for more information, type GO FOXFORUM on CompuServe.

Microsoft

WHERE DO YOU WANT TO GO TODAY?™

NETWORK EDITION

COVER STORY

SUMMARY OF FEATURES

BBS Software

■ YES □ NO

Products listed in alphabetical order

PC MAGAZINE
NETWORK EDITION
EDITORS' CHOICE

	PCBoard 15.21	Wildcat! 4.1	Worldgroup 1.0
List price	1 node, \$99 10 nodes, \$350	1 node, \$129 10 nodes, \$249	1 node, \$795 14 nodes, \$1,585
Maximum number of nodes	65,535	250	256
Nodes can be spread across a LAN	■	■	■
Caller can log on from a LAN	■	■	■
Includes client software	■	■	■
Supports RIP graphics	■	■	■
Customizable scripting language	■	Optional	Optional
Caller can log on from the Internet	■	Optional	Optional
Supports Internet news feeds	■	Optional	Optional
Provides an e-mail gateway	■	Optional	Optional
Supports QWK messaging	■	■	■
Supports multiple languages	■	■	■*
Maximum nodes per PC host	16	8	256
Disk space, RAM required for host	20MB, 450K	15MB, 512K	40MB, 4MB
Can use multi-CPU host system	■	■	■
Toll-free technical support	■	■	■

* Worldgroup supports multiple languages, but you have to provide your own translation

Mustang Software Inc.

Wildcat!

Here's a capable, complete BBS package at a bargain price. The single-user Wildcat! 4.1 package lists for \$129; the 250-node Wildcat! Platinum Suite lists for only \$999. Moreover, the Platinum Suite is bundled with several utilities, including an Internet and MHS mail gateway, a BBS management program, and a BBS customization program. These are sold as add-ons to the basic Wildcat! package.

Despite its low price, Wildcat! does not disappoint. The program installed quickly and easily: Setting up a two-line, two-LAN test system took us only about 45 minutes. We did have to crack the manuals to see how to configure Wildcat! for a Microsoft Windows NT Server LAN, but we made it through the rest of the setup process without help. Wildcat! supports a wide range of modems, including the latest crop of V.34 models. Mustang Software also maintains

**WE'D LIKE TO EXPOSE YOU TO
ORACLE POWER OBJECTS DEVELOPER'S RELEASE.
FOR FREE.**

**DOWNLOAD ORACLE POWER OBJECTS™ DEVELOPER'S RELEASE OFF THE INTERNET
AND TRY IT FOR FREE.**



NETWORK EDITION

COVER STORY

updated modem files on its own BBS.

Wildcat!'s messaging capabilities are excellent. The full-screen message editor includes a spell-checker (a nice touch), and QWK mail and Fido messaging are supported even in the single-user version. A \$149 option (included in the Platinum package) adds Internet e-mail and Usenet newsgroup support as well as Novell's MHS wide-area messaging capabilities.

Users calling into a Wildcat! BBS need only a modem and terminal program with ANSI terminal support, which comes with most operating systems. Wildcat! also supports RIP graphics. (Incidentally, QModem Pro, another Mustang product, is one of the few commercial communications programs to support RIP graphics.)

Like PCBoard, though, Wildcat! requires a third-party multitasking program to run more than one node on a PC. Wildcat! can run under OS/2, and comes with special OS/2 serial-port drivers to support multiport boards like those from DigiBoard and other vendors. We ran several copies of

Wildcat! in separate DOS sessions under Microsoft Windows 95 with no hitches.

Wildcat! supports a maximum of eight nodes per host PC—that's half the number supported by PCBoard. If you're planning a typical one- to five-line BBS, Wildcat! would be a great choice. If you're planning a large BBS with 100 lines, you'll need 13 host PCs to do the job with Wildcat!, 7 with PCBoard, and 1 with Worldgroup.

Wildcat! 4.1. List price: For 1 node, \$129; for 10 nodes, \$249; for 48 nodes, \$499; for 250 nodes, \$799. Platinum Suite, \$999. Mustang Software Inc., Bakersfield, CA; 800-999-9619, 805-873-2500; fax, 805-873-2599; BBS, 805-873-2400.

Circle 952 on reader service card

Galacticomm Inc.

Worldgroup

Industry observer Jeff Garbers once remarked that most communications software designers "see the world through 80-by-25 glasses." In other

words, they're stuck in the rut of writing software to mimic the 80-column by 25-line screen of a dumb terminal—even though the final product will run on the high-resolution color display of a 100-MHz Pentium machine.

The folks at Galacticomm must have overheard Mr. Garbers, because they've taken off their 80-by-25 glasses and stomped them to bits. Their new Worldgroup BBS software breaks the typical BBS-caller-as-dumb-terminal stereotype in several important and innovative ways.

A replacement for the company's Major BBS package, Worldgroup applies the client/server computing model to the BBS universe. If you're calling in with a traditional terminal program such as Crosstalk or Procomm, Worldgroup looks and operates much like a typical BBS. But if you dial up a Worldgroup BBS with Galacticomm's Windows-based Worldgroup Manager client software, you'll find that you're not in Kansas anymore.

Worldgroup Manager uses a proprietary

Now you can download the hottest new database development tool right from the Internet. Oracle Power Objects™ Developer's Release combines the power of enterprise-level client/server

Oracle Workgroup

2000™

Proof that you can.

tools with the agility and ease of use of popular visual programming

environments. This developer's release gives you the opportunity to evaluate Oracle Power Objects' remarkable features:

RAPID APPLICATION DEVELOPMENT.

Build client/server applications easier, faster, and with less code than ever before.

DRAW-AND-DROP OBJECTS.

Create truly reusable object components to achieve maximum

productivity using Oracle Power Objects' visual object model.

CLIENT/SERVER-OPTIMIZED.

Plug powerful client/server functionality into your applications with minimal coding.

CROSS-PLATFORM.

Now available for Windows and Mac. Look for OS/2 this summer.

STANDARDS-BASED.

Use Visual Basic syntax and leverage other industry standards, including OCX, ODBC and OLE2.

Make rapid application development a reality. Log onto Oracle's Web page and download Oracle Power Objects Developer's Release today.

This is not production software and should be used for evaluation purposes only.

<http://www.oracle.com/>

ORACLE

Enabling the Information Age

Available now on the Oracle Workgroup/2000™ trial CD-ROM (Version 3.0). To order call 1-800-492-9870, ext.4483. There is a \$15 shipping and handling charge.





2803 Stackable Ethernet Workgroup Hub

2813 Stackable Ethernet Workgroup Hub

YOU DON'T HAVE TO BE RICH TO BE WELL CONNECTED.

**CALL ABOUT
OUR STACKABLE
ETHERNET
WORKGROUP
HUBS.**

**1-800-8-BAYNET
EXTENSION 204**

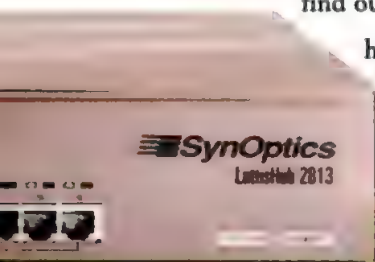
Actually, being well-connected is very affordable. Because now you can get high-quality Bay Networks Ethernet workgroup hubs for less than you expect. ➤ In other words, you can afford hubs from the company that pioneered 10BASE-T technology and has over 15 million nodes installed. ➤ There's a Bay Networks workgroup hub to meet almost any need—from the most simple connections to the most complex. So any

solution you choose will grow with your business—including our network management options.

➤ It's one more way we give you choices for your network. So return the attached card or call 1-800-8-BAYNET ext. 204 to receive "A Practical Guide to Plug & Play Ethernet Networks" and

find out how affordable our workgroup hubs really are. The numbers may surprise you. The quality won't.

800 Ethernet Workgroup Hub.



Bay Networks

The Merged Company of SynOptics and Wellfleet

© 1995 Bay Networks, Inc.

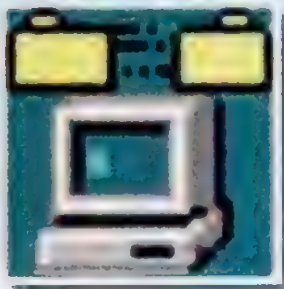
\$95 for '95

SmarTerm® 32-Bit Edition for Windows® 95 Your Smart Choice for PC-to-Host Connectivity



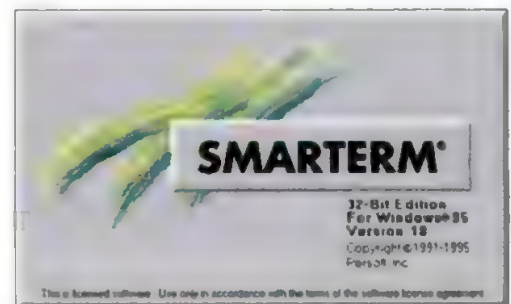
As you migrate to Windows 95, make the Smart Choice for only \$95...but only in 1995. Use SmarTerm to maintain your PC connections to UNIX, IBM, and DEC hosts without interruption.

SmarTerm offers you the most precise VT and TN3270 emulation for Windows 95. Now you can move to Windows 95 without having to worry about losing your host connections.



SmarTerm is designed to automate common tasks, making your work easier. Whether you record a script, use the pop-up keyboard to learn keyboard mapping, send mail messages directly from SmarTerm, or transfer files with the drag-and-drop interface, SmarTerm saves your corporate help desk training time and support costs.

SmarTerm is a true Windows 95 application. It is easy to use and learn because it's Microsoft Office compatible, giving you a familiar look and consistent way to work with the other applications you use everyday.



**Make the Smart Choice for Windows 95 with SmarTerm.
Call your local software dealer today for \$95 for '95.**

Persoft, Inc. 465 Science Dr. P.O. Box 44953, Madison, Wisconsin 53744-4953 U.S.A.
Phone (608) 273-6000, Fax (608) 273-8227, Sales: 1-800-EMULATE or sales@persoft.com.
World Wide Web: www.persoft.com

Persoft, Inc. European Headquarters: Lower Woodend Barns, Fawley, Henley-on-Thames, Oxfordshire RG9 6JF UK
Phone +44 (0)1491 638090 Fax +44 (0)1491 638010

CIRCLE 853 ON READER SERVICE CARD

persoft®

CONNECTIVITY SOLUTIONS
DOS • Windows • Ethernet • Token Ring

SmarTerm 32 Bit Edition for Windows 95 pricing available through December 31, 1995. Regular suggested retail price is \$395. ©1995 Persoft, Inc. All Rights Reserved. Rev. 6/95
Persoft and smarterm are registered trademarks of Persoft, Inc. Windows is a registered trademark of Microsoft Corporation. All other trademarks are property of their respective owners.

communications protocol between the host and client. The protocol provides an additional layer of error checking and a multi-session communications link. The multi-session feature means that you can do multiple tasks simultaneously—browse through messages while you download a file, for example. It allows up to 30 sessions.

Because the Worldgroup client/server runs under Microsoft Windows, common BBS operations such as reading messages and scanning file libraries take on an entirely new feel. If you've ever used CompuServe's WinCIM or America Online, you'll feel right at home with Worldgroup.

In fact, the graphical nature of Worldgroup makes even the most basic BBS look like a polished, professional on-line service. Commonly used menus, background graphics, and even sounds reside on the client PC,

so Worldgroup doesn't have to send large chunks of data back and forth between the client and host. This results in quick response time, often so fast that it feels as the BBS is running on your own machine.

Now for the bad news: The Worldgroup client software is big. It requires at least 10MB of disk space for program and data, and Galacticomm recommends 18MB. Fortunately, the same copy of Worldgroup Manager can be used to contact several BBS systems. The client program supports modem, LAN, direct serial connection, and Internet telnet connections (optional).

Galacticomm encourages BBS operators to distribute the client software for free; the host software even has an option to build a .ZIP file or installation disk containing Worldgroup Manager. Callers can dial in with any terminal program, down-

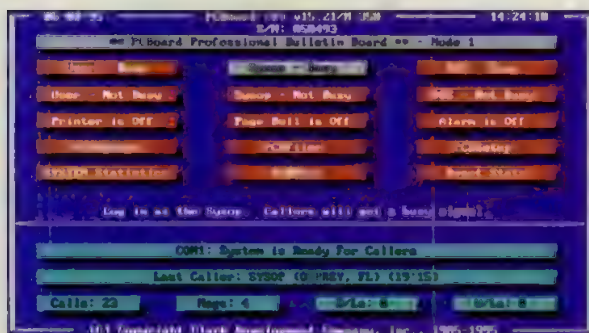
load the client, and then call back with the client software.

As with the other packages tested here, the Worldgroup host software runs under DOS. Worldgroup, however, requires a 486 with 8MB of RAM and 200MB of hard disk space for adequate performance. The host software, called Worldgroup Server, supports up to 256 2,400-bps modems on a single machine. Faster modems eat up more system resources, so you can use only 104 V.34 modems. This is still considerably more than enough for the typical corporate BBS.

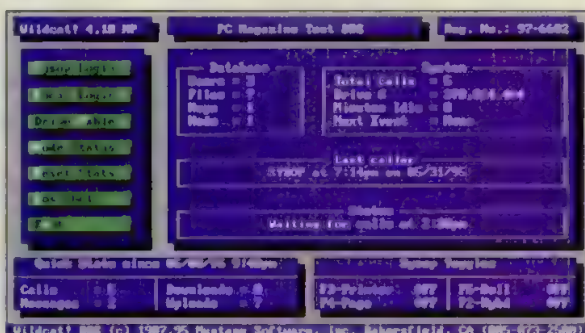
Worldgroup Version 1.0. List price: For 2 nodes, \$795; each additional 6-node pack, \$395. Galacticomm Inc., Fort Lauderdale, FL; 800-328-1128; fax, 305-583-7846; e-mail, sales@gcomm.com; Web, <http://www.gcomm.com>.

Circle 953 on reader service card

What's in a Screen



PCBOARD: A PCBoard host waits for a call. The red boxes are menu items; the blue boxes show status. From this screen, you can log on to the BBS, manage BBS files and message areas, and perform other BBS maintenance chores.



WILDCAT! The Wildcat! status screen is similar to the PCBoard screen. The buttons at the left let you log on, take a quick look at remaining drive space, or see who else is logged on. Three windows at the right and bottom show the system's current status. User and file maintenance chores are handled by a separate program



WORLDGROUP: Unlike PCBoard and Wildcat!, Worldgroup uses a separate Introductory Menu when the BBS is off-line. From this menu you can set modem channels, access restrictions, sign-up options, and help screens. Once your system is customized, the central "Go!" button brings the BBS on-line.



WORLDGROUP: On the busy Worldgroup Main Console screen, the matrix at the left shows users connected. The Audit Trail window shows the last few entries in the system audit log. A small System Usage window shows the BBS's workload, while the System Variables window shows a few vital statistics

GETTING DATA QUICKLY IS IMPORTANT. WE'LL MAKE THIS BRIEF.



StorageWorks™

RAID ARRAY 210 SUBSYSTEM:

*High-performance, high-availability,
networked storage starting at \$7,000.*

- Max I/O rate: 2,000/second
- Max transfer rate: 14/MB/second
- Capacity: 88GB
- Available for Novell, Windows NT™
and UNIX®
- Hot-swappable drives, automatic
failover to hot spares, redundant
components
- Multiple RAID level support; mixed
RAID levels within drive groups
- Simple installation and management
- Modular design for easy upgrades

*Need more data? Give us a call at
1-800-786-7967. End of story.*

digital™

yes
Performance
Tested and
Approved

RENNET

iRAB
RAID Level 10 Controller

CIRCLE 930 ON READER SERVICE CARD

First Looks

HANDS-ON REVIEWS OF NEW SHIPPING PRODUCTS

CD-ROM SERVERS

Networked CD-ROMs Made Simple

By Steve Rigney

First, consider the fact that even though hard disk prices seem to drop every day, the units will probably never be as affordable and flexible as CD-ROM drives. Then take into account the fact that most new applications and operating systems are shipped on CD-ROMs. Combine these two factors and you have a compelling reason to deploy a CD-ROM server on your network.

In this review, we look at two popular CD-ROM servers: Microtest's DiscPort Tower and SciNet's CD-System. Both products are extremely easy to install; more important, they both allow you to make multiple CD-ROM drives available to users on your network.

Each product has distinct advantages. The DiscPort Tower, for example, offers better performance, manageability, and tighter integration with NetWare than the CD-System but is limited to NetWare LANs. On the other hand, the CD-System can hold more CD-ROM drives, and it plugs into almost any network environment, but it is more expensive and lacks management tools.

Microtest Inc.

DiscPort Tower

Microtest's DiscPort Tower (\$3,195) has just about everything you could ask for in a CD-ROM server. It's a snap to set up, offers good performance, and includes an easy-to-use utility for managing and connecting to your network CD-ROMs. The product comprises four quad-speed CD-ROM drives in

a chassis the size of a mini-tower PC and DiscView PRO, Microtest's CD-ROM-management software. The chassis has both BNC and 10Base-T Ethernet

connections, so you can place it anywhere on your network. During installation, DiscView copies six NLMs to your NetWare file server. After you have installed the hardware and software, you can use DiscView to mount your CD-ROM drives and make them available to end users.

On client PCs, each CD-ROM drive appears as a stan-

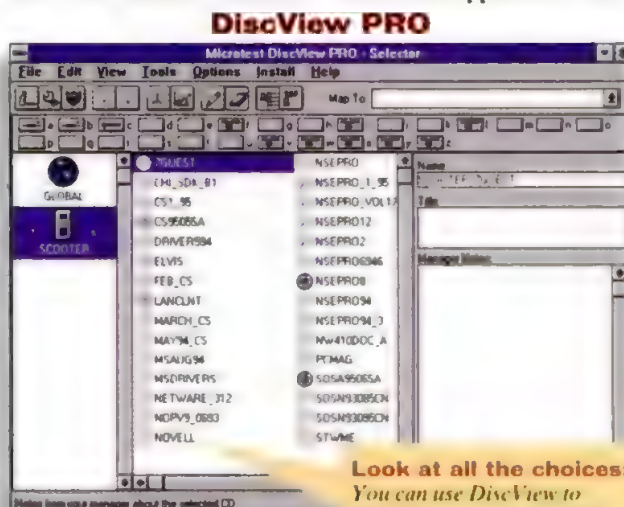
dard NetWare volume. Unlike SciNet's CD-System, which emulates NetWare (see below), DiscView actually works with NetWare Directory Services

(NDS) under NetWare 4.x and with NetWare 3.x's Bindery. You can also use DiscView to manage all of your DiscPort Pros and DiscPort Towers from a central location. In addition, the DiscPort Tower includes a helpful utility called SmartLaunch that can automatically mount and dismount CD-ROMs, log users on to and out of file servers, map and unmap drive letters, and automatically launch applications located on the networked CD-ROMs.

During our tests, we connected the DiscPort Tower to a NetWare 4.1 server and used DiscView to mount a variety of reference and multimedia CDs. To test performance, we executed a search using Computer Select, with *Windows* as our keyword. Our query required approximately 3 seconds using the DiscPort Tower, slightly less time than the 4.3 seconds it took SciNet's CD-System to complete the same search.

Besides the DiscPort Tower and the DiscPort Pro, Microtest offers two other network CD solutions: DiscServ and CD-Now!, both of which are software-only products. DiscServ allows you to install CD-ROMs

Continues on page NE26



Look at all the choices: You can use DiscView to select from a host of available CD-ROMs (some serious, some not so serious).

connections, so you can place it anywhere on your network.

For the DiscPort Tower, Microtest basically combined the latest versions of two other products: the DiscPort Pro and DiscView. The DiscPort Pro (see the sidebar "Build Your Own CD-ROM Server") is a hardware device that you can connect to multiple CD-ROM drives and place anywhere on an Ethernet network. DiscView is a Windows-based utility that allows you to manage such drives by controlling access rights, monitoring statistics, and mapping NetWare drive letters to them.

SIMPLE SETUP

To get the DiscPort Tower up and running, all you have to do is connect it to the network cable and install DiscView on a Win-

dows-based client PC. During installation, DiscView copies six NLMs to your NetWare file server. After you have installed the hardware and software, you can use DiscView to mount your CD-ROM drives and make them available to end users.

DESKTOP VIDEOCONFERENCING

ProShare Signs On to a Standard

By O. Ryan Tabibian

In networking, the term **proprietary** can often be a four-letter word. This is certainly true in the area of desktop videoconferencing—a fact that Intel seems to acknowledge. The new Intel ProShare Video System 200, Version 1.8 (\$2,499 per seat), is compliant with the H.320 videoconferencing standard, allowing the product to

communicate with a variety of other vendors' systems. As we discovered during our tests, the H.320 support works great, even though it is less than tightly integrated into the system.

ProShare 200 comes with just about all the hardware and software you need to turn your PC into a videoconferencing station over an ISDN or LAN

Continues on page NE30

First Looks

CD-ROM Servers

Continued from page NE25



DISCPORT TOWER: It offers good performance and manageability.

on your NetWare 3.x and 4.x file servers; CD-Now! allows you to turn any desktop PC into a network CD server.

For a CD server solution that provides excellent manageability and solid NetWare integration, it's hard to go wrong with the DiscPort Tower.

DiscPort Tower. List price: \$3,195. Microtest Inc., Phoenix, AZ; 602-952-6400; fax, 602-952-6401.

Circle 954 on reader service card

SciNet CD-System

What if you need a CD-ROM server for more than four drives, or you're not running NetWare? Then you should look into SciNet's CD-System (\$4,495 for a four-drive unit). While the DiscPort Tower (see above) requires a NetWare 3.x or 4.x file server, the CD-System comes with one to seven quad-speed CD-ROM drives in a single chassis and can connect to almost any type of network. The CD-System software emulates a NetWare file server, however, so you have to at least load NetWare client drivers on any PC that needs to access the shared CD-ROM drives.

The CD-System is approximately the same size as the

DiscPort Tower but includes eight slots, compared with the DiscPort Tower's four. The top slot of the CD-System houses a 386-based PC, and the other seven slots can hold internal CD-ROM drives. The CD-System also includes an external SCSI adapter that you can use to add 7 external CD-ROM drives, for a total of 14 drives per server.

The brain behind the CD-System server is SciNet's CD-Manager software. CD-Manager is also available separately (\$495 for a five-user license) and allows you to turn any PC into a network CD-ROM server. The software acts like a NetWare 3.x file server by handling NetWare Core Protocol requests, so you can connect to it using any DOS- or Windows-based NetWare client.

EVEN EASIER

As easy as the DiscPort Tower was to set up, the CD-System was even easier. In fact, its installation ranks among the sim-

plest of any network product we've ever seen. The entire procedure goes like this: You remove the unit from the box, connect the power and Ethernet cables, insert the CD-ROMs, and flip the power switch.

You don't have to install any software on the client PCs, and the CD-System can automatically sense the Ethernet frame type you are using and even the internal IPX number of your other NetWare servers.

After we installed the hardware, we went to a client PC and ran SLIST (the NetWare server list utility). The CD-System appeared as one of our NetWare servers. Within 5 minutes of unpacking the box, we were running applications on the shared network CD-ROMs.

The catch? Unfortunately, because the CD-System does not include any special software such as DiscView PRO, you can manage your CD-ROM drives only through NetWare's SYSCON utility (or a third-party alternative). The



CD-SYSTEM: It can house up to seven CD-ROM drives.

CD-System also works only with Bindery emulation on NetWare 4.x networks.

But if ease of installation is key, or if you need to set up shared CD-ROMs for non-NetWare networks, the CD-System may be the perfect solution.

CD-System. List price: Tested configuration, \$4,495. SciNet, Santa Clara, CA; 408-492-9365; fax, 408-492-9379.

Circle 955 on reader service card

Build Your Own CD-ROM Server

The greatest appeal of a turnkey CD-ROM server like Microtest's DiscPort Tower or SciNet's CD-System is the convenience

it offers (see "Networked CD-ROMs Made Simple"). These towers are relatively expensive, however, and you may find that it is less costly to build your own CD-ROM server.

If you want to do it yourself, Microtest's DiscPort Pro (\$1,595) is a great tool to get the job done. Like the DiscPort Tower, the DiscPort Pro allows you to share CD-ROMs with all of the users on your NetWare network. The DiscPort Pro, which resides in a chassis smaller than a subnotebook, includes both a BNC and a 10Base-T connector and offers two SCSI ports for connecting up to 14 CD-ROM drives to your Ethernet network.



DO IT YOURSELF: If you want to network individual CD-ROM drives, try the DeskPort Pro.

Like the DiscPort Tower, the DiscPort Pro includes DiscView PRO (a management utility) and a set of NLMs that let

the device communicate with the NetWare server. You can map drive letters to the individual CDs, and DiscView will automatically mount and map a drive letter to a CD-ROM drive when you insert a CD into it.

The DiscPort Pro is easy to use and gives you the flexibility to add CD-ROM drives to your network gradually. Each CD-ROM drive that you add requires only about 300K to 500K of server RAM, so you will probably not have to upgrade your server until you add 12 or more drives.—SR

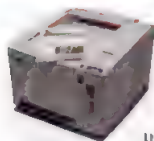
DiscPort Pro. List price: \$1,595. Microtest Inc., Phoenix, AZ; 602-952-6400; fax, 602-952-6401.

Circle 956 on reader service card



NETWORKCOLOR

The QMS® *magicolor* LX Laser Printer • \$4,999* • 600x600dpi • 6ppm/color • 12ppm/b&w • CrownCopy™ Copier Option



Laser fast network color printing with network technology no one else has. And, at only \$4,999, your dollar goes a long way. No matter how fast your workgroup multiplies, the QMS *magicolor*® LX laser printer keeps reproducing at a lower cost per user than any other color printer. Leap over your competition with improved network performance. Plus, you get monochrome efficiency with the added benefit of color printing – now the colors you see on the screen are the colors you see in print. Plug & play support for any platform allows everyone to hop on immediately. You can even add CrownCopy, the exclusive QMS copier option. So jump to it and replace your printers for a big difference in network color.



Printers for Professionals.

Call for your FREE "Network Printing for Professionals" Interactive Disk. 800 972-6708 or FAX 334 633-4866

Name First Last

Company

Address

City State Zip

Phone

Fax

Return to: QMS Marketing Services, One Magnum Pass, Mobile, AL 36618 Dept. 5065

800 972-6708 Dept. 5065

Internet: <http://www.qms.com/>

For service on QMS or other products, call 800 762-8804 U.S. • Q-Fax 800 675-7217 • Canada 800 981-2000 • *QMS Reference Price: U.S.
QMS, magicolor, CrownCopy, and the QMS logo are trademarks or registered trademarks of QMS, Inc., One Magnum Pass, Mobile, AL 36618, 334 671-4700. All other trademarks are the property of their respective companies.
No animals were harmed in the production of this advertisement. All coloration was achieved through photo retouching.

CIRCLE 884 ON READER SERVICE CARD

© QMS, Inc. 1995

Connect everything to everything. How hard can that be?

A little wire, a bit of software, a few special widgets, and *presto!* — a can of worms. Ah, networking in the '90s.

Building a bulletproof network requires the kind of experience, technology and long-term vision you won't find with narrowly focused sub-specialists.

IBM has been dealing with the ins and outs of interconnectivity and interoperability for decades. Connect multiple platforms and multiple operating systems? Yes. Make peace between industry standards and proprietary applications? Yes. Work on an intraoffice or international scale? Yes. Provide a growth path to emerging technologies? Yes.

Gone are the days of single-vendor solutions. But you can always use at least one partner with the nuts-and-bolts-to-big-picture savvy to make it all work together beautifully.

You are here here here and here



IBM NETWORKING

ATM: from desktop to campus to wide area networks, public and private, with the Nways™ family.

Hubs, Concentrators, Adapters and Switches: Ethernet, Token Ring, FDDI and ATM for any size network with the Nways family.

Wireless Technology and Products: real-time communications anytime, anywhere.

Communications Software: including TCP/IP, Internet access, APPC/APPN, PC emulators and gateways; like PC/3270, PC/400 and Communications Manager for OS/2.

Systems Management Software: manage all IT assets, no matter how diverse or dispersed, from one place with SystemView™ Series.

Messaging Software: application connectivity across heterogeneous platforms and protocols with MQSeries.

For more information, call
1 800 IBM 3333, ext. JA113
<http://www.raleigh.ibm.com/notad.htm>



IBM®

Solutions for a small planet™

NETWORK EDITION

First Looks

Intel

Continued from page NE25

connection. The hardware consists of a video-capture board, an ISDN adapter, a video camera, and a combination earphone and microphone. Intel does not include a LAN adapter with the product, so if you need LAN-based videoconferencing, you will have to purchase an adapter separately. The software comprises the ProShare videoconferencing application along with whiteboard and application-sharing software.

Since our last videoconferencing roundup ("Candid Camera," April 25, 1995), ProShare 200 sports two main new features: the H.320 support and some enhancements to the video quality.

DECISION TIME

Unfortunately, Intel's approach to H.320 compliance is only a partial solution. The point of H.320 is to mask the user from the complexities of coordinating a videoconference with another, different system. With ProShare 200, you actually have to know beforehand whether the system on the other end of the connection requires H.320 or not. If it does, an H.320-compliant application launches; if it doesn't, a different, non-H.320-compliant application launches. It would

be a lot smoother and even more user-friendly for a single application to handle both H.320 and non-H.320 communications.

Still, ProShare 200 works well and is among the most affordable systems on the market. In fact, you can even purchase the product through most regional telephone companies for around \$1,000 (usually in conjunction with the installation of ISDN service).

TEST DRIVE

We installed ProShare 200 on two HP Vectra XU systems, each with Pentium/90 CPUs and 16MB of RAM. We found that the product has some stringent hardware requirements, since it utilizes a software video codec (compression/decompression algorithm). Hardware-based codecs are typically much faster but also more expensive, since they require higher-end video boards. Intel's recommended minimum configuration is a 486/33 CPU with 8MB of RAM. We recommend something with a bit more muscle, however: preferably a Pentium/90 with 16MB or more of RAM.

To test ProShare 200's H.320 compliance, we established a



STARTER KIT: ProShare 200 comes with just about everything you need to set up a videoconferencing station.

videoconference between our ProShare 200 station and an AT&T Vistium 1300 station over an ISDN link. The process was simple, and we were up and running in a matter of minutes. We were not able to share documents or applications due to compatibility problems between the two systems' software, but this issue is not addressed by the H.320 standard.

We found both the audio and video quality to be acceptable on our ProShare 200 and Vistium systems—making them definitely comparable with other, similar systems currently available.

We also tried ProShare 200 over a LAN connection, which was much more difficult to set up. For one thing, although Intel

claims that both ISDN- and LAN-based videoconferencing are part of the ProShare 200 package, you cannot use the product over LANs without paying an additional \$499 for the Intel LANdesk Personal Conferencing Manager (LPCM). This product runs on a separate PC and manages the network resources required to establish video sessions.

One of the problems with the LAN installation is that you must edit each station's SQBIND.INI file by adding the network address of the LPCM control station. This process was unintuitive and—worst of all—unclear in the documentation. Other LAN-based videoconferencing solutions, such as InVision Systems Corp.'s InVision, integrate network management tools within the software and do not require any manual configuration of .INI files.

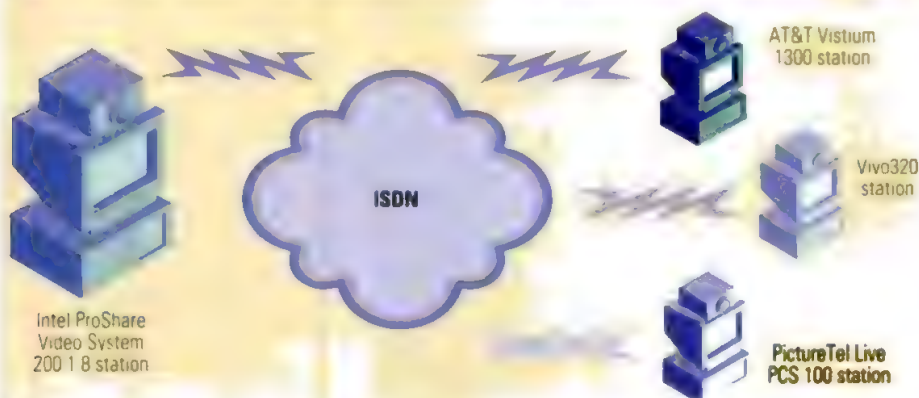
Despite this unintuitive LAN installation routine and the separate executables for H.320 support, ProShare 200 is one of the most comprehensive and mature videoconferencing solutions that you will find on the market today. With a few more tweaks, it could be the best.

Intel ProShare Video System 200, Version 1.8. List price: \$2,499 per seat. Intel Corp., Santa Clara, CA; 800-538-3373; fax, 800-525-3019.

Circle 971 on reader service card

Expanding Horizons

With H.320 support, ProShare can now communicate with a wide variety of other vendors' videoconferencing systems



RUSH HOUR,
AS DESIGNED BY NETWORK
PROFESSIONALS.



TCP/IP CONNECTIVITY,
AS DESIGNED BY
NETWORK PROFESSIONALS.



You're not asking for the moon. You just want to be able to get through heavy traffic smoothly. Which is now a lot easier on your network than it is on the freeway.

Because Reflection Network Series 5.0 offers all the transport protocols and applications you need to get from

point A to point B—and all points in between. Including the TCP/IP stack rated #1 by *InfoWorld* magazine. Plus an extensive set of management and diagnostic tools to keep you in control, sophisticated applications, and complete mobile and wireless access, compliant with industry standards.

TCP/IP

To try TCP/IP connectivity designed from your point of view—all from one vendor—call today for your free evaluation copy. Then relax, lean back, and put your network on cruise control.

For a **FREE** evaluation copy, call
800.926.3896

Reflection
WRQ
CONNECTIVITY FOR A CHANGING WORLD

REFLECTION NETWORK SERIES®

- ▲ **COMMUNICATIONS:** TCP/IP, UDP, LAT, NS/VT, IPX/SPX, SLIP, CSLIP, NETBIOS
- ▲ **LEADING APPLICATIONS:** NFS CLIENT WITH OLE SUPPORT AND NFS ADMINISTRATOR, DRAG-AND-DROP FTP, TFTP, LPR/LPD, FINGER, PING, ENHANCED MOSAIC, NEWSREADER, AND MAIL
- ▲ **NETWORK MANAGEMENT FEATURES:** SMART SET-UP, SNMP MIB II WITH TRAPS AND PRIVATE MIB, EVENT VIEWER/LOG, NETWORK TRACE, TRACE ROUTE, OVER 200 NETWORK STATISTICS, DHCP, BOOTP, RARP
- ▲ **ARCHITECTURE:** COOPERATIVE VxD/DLL FOR PERFORMANCE AND RELIABILITY. 100% WINDOWS SOCKETS COMPLIANT
- ▲ **MOBILE/WIRELESS COMPUTING:** OPTIMIZED FOR SERIAL AND CELLULAR COMMUNICATIONS (SLIP, CSLIP, CSC, CDPD, AND GSM)
- ▲ **TECHNICAL SUPPORT:** FREE PHONE SUPPORT, BBS, TECH NOTES BY FAX AND WORLD WIDE WEB

WRQ REFLECTION OFFERS COMPLETE SOLUTIONS FOR UNIX, X, HP, DIGITAL, AS/400, 3270, AND TCP/IP CONNECTIVITY.

CALL 800.926.3896 IN EUROPE, CALL +31.70.375.11.00
OUTSIDE EUROPE, CALL 206.217.7100
INTERNET: sales@wrq.com WEB: <http://www.wrq.com>

WALSH BROTHERS & SONS, INC. / 1000 EASTER AVENUE NORTH, SEATTLE, WASHINGTON 98108-1144 / FAX 206.217.0090 ▲ BATESMAN & CO. / 2513 14TH AVENUE, THE NETHERLANDS / FAX +31.70.354.11.44 ▲ WILHELM-MANN-WERKE, HEINRICH-HAENSE-ALLEE 53, 40213 DUISBURG, GERMANY / FAX +49.211.8107.880 ▲ LEONOR, 1, RUE DE LA NAYE, 92731 BOSTY CROIX FRANCE / FAX +33.1.49.19.22.16
© 1995 WRQ. ALL RIGHTS RESERVED. WRQ, THE WRQ LOGO, AND THE WRQ CONNECTIVITY FOR A CHANGING WORLD ARE THE PROPERTY OF THEIR RESPECTIVE HOLDERS.



*U.S. list price as of 5/1/95. †In Canada, call 1-800-367-3667, Dept. 9561. Five-year on-site warranty; after five years return hub to HP. Power supply and fan covered by five-year on-site warranty only. 8-port hub lifetime limited warranty, return to HP only. Windows is a U.S. trademark of Microsoft Corporation. ©1995 Hewlett-Packard Company. RND022

"I never know what the company's going to ask of our NETWORK, so I just tell 'em, 'Hey, we're FLEXIBLE.' HP AdvanceStack 10BASE-T hubs keep me honest."

I was one of those kids who had an HP calculator at the ready constantly, and I knew the words Hewlett-Packard stood for quality and reliability. But when it comes to the world of networking, that's only part of the HP story, as I soon discovered.

In the media business, everything can change from one day to the next. Here at Media General, we're in newspapers and TV right now, but



*Richard Lee
Director of
Operations
Media General
Publishing
Cable TV*

who knows what's coming?

That's why we spec HP AdvanceStack 10Base-T hubs. It's just a smart business decision. If we suddenly acquire, let's say, some new online service, we know the network can handle it. And with HP's expansion slot

technology, network management or advanced functionality are easy additions whenever I need them. All while staying very competitive on my cost-per-port.

For more information on how HP AdvanceStack hubs can fit your changing needs, give 'em a call today at 1-800-533-1333; Ext. 9561. It's a great story, and it's all true.

HP Networking
We've been there all along.

- Available in 12-, 24-, and 48-port models with expansion slot starting at under \$58/port.* expansion slot products include SNMP, routing and remote access
- Available in 8- and 16-port upgradable models starting at under \$37/port*
- Full stack manageable via a single SNMP module
- Supports HP OpenView network management software
- Each hub ships with HP Stack Manager, a Windows™-based management solution
- Maximum configuration: 784 nodes, 16 hubs
- Hub-to-hub connections via industry standards-based cables
- 185-meter hub separation capability
- Hot swap capabilities
- MTBF: 274,000 hours (12-port model)



**HEWLETT®
PACKARD**



NETWORK EDITION

First Looks

MANAGEMENT SUITES

Everything but the Kitchen Sink

By Greg Atwang

Based on the number of included features, BrightWorks 2.01, from McAfee Associates, is one of the most complete network management suites currently available. With application metering, asset management, software distribution, server monitoring and tuning, desktop management, a new help-desk system, and optional antivirus and remote-control modules, BrightWorks includes everything but the proverbial kitchen sink. Although installation can be time-consuming, administrators will appreciate the end result.

BrightWorks is distributed on CD, so you don't have to do the floppy disk shuffle. But the documentation is also stored on the CD—good from an environmental standpoint, but bad when you need quick access to the manuals during installation. You can view or print the documentation using the included Adobe Acrobat Reader (each manual is several hundred pages long) or order the printed manuals for an additional \$35.

BrightWorks runs on a NetWare 3.x or 4.x server (with a minimum 12MB of RAM) and makes heavy use of NLMs. The reliance on NLMs gives BrightWorks a slight edge over Saber LAN Workstation (also reviewed in this issue) and other non-NLM-based management products when it comes to server monitoring.

Unlike Saber LAN Workstation, BrightWorks includes a help-desk application by default. The LAN Support Center (LSC) lets you set up support categories and responses to support calls, reducing the time it takes support staff to respond. You can also set filters on fields such as problem type or product category to help search through call-ticket records. LSC is not as full-featured as Software Mar-

keting Group's Support Express, which is available as an add-on for Saber LAN Workstation, but it is a solid utility and is very tightly integrated into BrightWorks.

Other new features include

BrightWorks' real strength. Software usage can be monitored and controlled across file servers for DOS, Microsoft Windows, OS/2, and Macintosh clients. You tag applications or suites for metering and can set several properties, such as maximum concurrent users, rules for license borrowing between servers, program files to meter, and the amount of time a user

its own QuickScript language. While QuickScript retains the scripting language and interface from previous versions of BrightWorks, PowerScript is a Visual Basic-like tool designed with nonprogrammers in mind. If you're not familiar with the QuickScript language, you'll find PowerScript to be a welcome alternative.

BrightWorks' LAN Inventory module tracks an enormous amount of information from servers as well as PC and Mac clients. Inventory data is broken into logical categories such as computer information, mass storage, memory, and software applications. One of the only problems we ran into while testing BrightWorks was with this module, however. It reported some odd CPU clock speeds: A DX4/100 was reported to run at 259 MHz and a DX2/66 at 185 MHz. McAfee knows about this problem, which should be fixed by the time you read this.

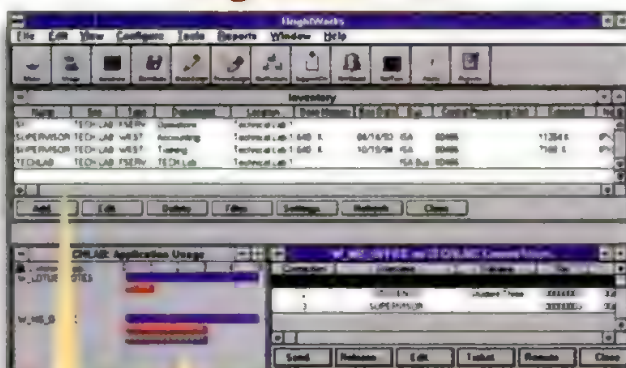
The newly added Hawknet NetTune module allows you to monitor NetWare Server statistics. A Quick Analysis option gives you recommendations for your server, such as: "Insufficient Cache, add memory." The SmartTune feature lets you update server SET parameters manually, at timed intervals, or automatically, based on real-time data. Through the included Crystal Reports module, you can generate detailed reports on data from all of the BrightWorks modules.

Perhaps the best feature of BrightWorks (and most of McAfee's other software as well) is the fact that you can try it before you buy it: A trial version is available on McAfee's BBS and on its World-Wide Web site.

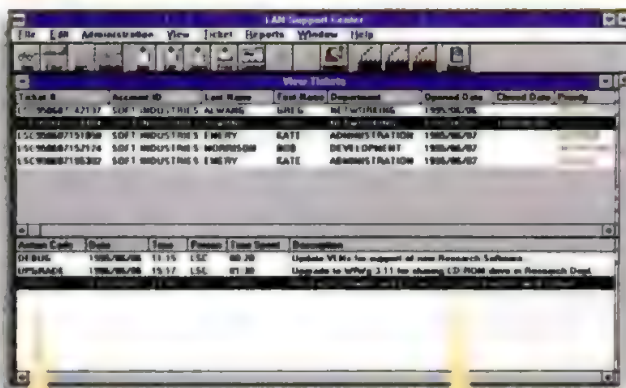
BrightWorks 2.01. List price: \$15 to \$60 per user, depending on the number of users. McAfee Associates Inc., Santa Clara, CA; 408-988-3832; fax, 408-970-9727; BBS, 408-988-4004; Web, <http://www.mcafee.com>.

Circle 970 on reader service card

BrightWorks 2.01



FROM ALL ANGLES: BrightWorks lets you monitor several types of information, including inventory and application usage, from a single console.



HELPING HAND: BrightWorks' LAN Support Center lets you track help-desk problems from onset to solution.

enterprise metering via IPX and TCP/IP, a second scripting language, and NLM-based inventory. In addition, BrightWorks' interface has evolved into a tightly integrated and intuitive console screen where all modules and add-ins are a mouse-click away.

Enterprise software meter-

ing through SiteMeter is waits in a queue. (For more details, refer to "SiteMeter: Use It or Move It," Network Edition, April 11, 1995.)

As in Saber LAN Workstation and Frye Utilities' SUDS module, BrightWorks' software distribution is accomplished through scripts. In this version, McAfee included a simplified PowerScript tool in addition to

Let's Talk Access Solutions

DDS

ISDN

FDDI

**LAN
ACCESS**

T1

**FRAME
RELAY**

From high speed multiplexers
to packet switches - just say
the word and we'll introduce
you to cost-effective products for
accessing your choice of networking
service. With a broad range of LAN & WAN
products (over 300!) RAD offers you one-stop
shopping backed by long-term reliability.
And we're at home all over the world, complying
with international standards in over 70 countries.
We research, develop and manufacture everything
we sell. No other company has so much to offer.
So if you're looking for network access, give
us a call, and we'll talk access solutions.

RAD

data communications

CIRCLE 923 ON READER SERVICE CARD

U.S. Headquarters: 900 Corporate Drive, Mahwah, NJ 07430 Tel: 201/529-1100 Fax: 201/529-5777 Midwest: Tel: 708/342-9999 Fax: 708/342-9986
West Coast: Tel: 714/897-2448 Fax: 714/891-1764 International Headquarters: 8 Hanechoset Street, Tel Aviv 69710 Israel Tel: 972-3-6458181 Fax: 972-3-498250

RAD Data Communications, Inc.

First Looks

MANAGEMENT SUITES

A Good Suite Gets Better

By Greg Alwang

Saber LAN Workstation is well known for its powerful mix of administrative and end-user management tools. The latest release, Saber LAN Workstation (SLW) 5.0b, stays true to its roots but adds some features that can help ease the network management burden.

End users will applaud the new drag-and-drop features of the Windows Menu Desktop, while administrators will appreciate the added support for NetWare 4.x's NetWare Directory Services (NDS) and the inclusion of the slick new Script Builder, which helps nonprogrammers take advantage of Saber's powerful scripting language. Those who need an edge on network tech support can purchase Software Marketing Group's Support Express for Saber LAN as an add-on.

SLW emphasizes user management through its tight control over the log-on process as well as complete control over each user's desktop environment with the DOS- or Windows-based Saber Menu System. As in previous versions, SLW 5.0b offers hardware and software inventory, application metering, software distribution, remote access, the SaberBASIC scripting language, and Saber's powerful menuing and desktop management system.

Unlike McAfee's BrightWorks (reviewed in this issue) or Intel's LANDesk, SLW does not use NLMs. Instead, management information is collected and disbursed using agents on each managed machine. The main benefit of not relying on NLMs is that SLW can work in almost any network environment: LAN Server; LANtastic; Microsoft Windows NT Server; NetWare 2.x, 3.x, and 4.x; Pathworks; and VINES.

As with BrightWorks, SLW's installation can take a significant

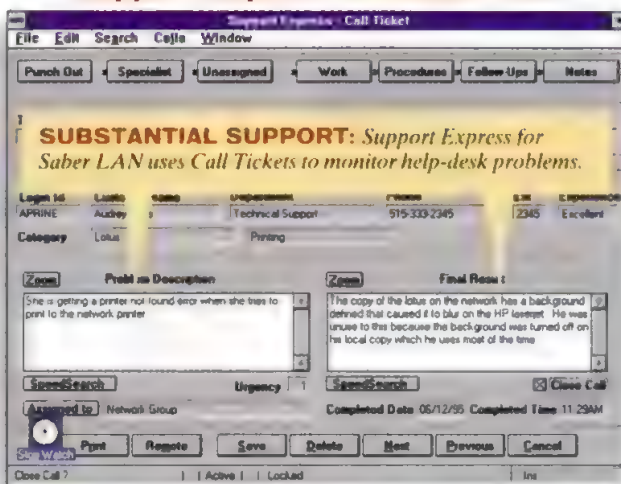
amount of time and planning. Be prepared to go through every step of the Setup and Console manuals, especially if you want maximum control over network users and resources.

Since most network managers

and its companion module, Express Link, work directly with SLW's inventory files to simplify LAN user support.

Support Express uses Call Tickets to track support issues. The elegant interface provides instant access to support history, allowing help-desk staff to resolve problems quickly and record solutions to common problems for future use. Solu-

Support Express for Saber LAN



also function as help-desk workers, the optional Support Express module (\$2,995 for the first user, \$1,249 for each additional user) for SLW should have significant appeal. Support Express

tions can be sent to end users over a variety of e-mail systems.

Several of SLW's basic utilities sport new features in Version 5.0b. For example, the new hardware-inventory agent can

collect not only AUTOEXEC.BAT and CONFIG.SYS files, but also NET.CFG and various .INI files from each client.

SLW's file-distribution agent works directly with Saber's hardware inventory and lets you transfer files and update client-configuration files based on certain selected criteria. Other new features include an option that allows users to decline an incoming distribution job.

SLW's file distribution has always been powerful, thanks to Saber's extensive SaberBASIC scripting language. SaberBASIC, however, can be a bit intimidating to nonprogrammers—until now, that is. The new Script Builder uses a Wizard-like interface that lets you create distribution scripts with ease—all without writing a single line of code. You can even use it as a learning tool for programming by selecting functions and monitoring the SaberBASIC code generated behind the scenes.

Saber LAN Workstation 5.0b. List price: For documentation and one user license, \$299; for each additional user, \$59. Saber Software Corp., Dallas, TX; 800-338-8754, 214-361-8086; fax, 214-361-1882.

Circle 968 on reader service card

McAfee Acquires Saber

BrightWorks 2.01 and Saber LAN Workstation (SLW) 5.0b—both network management suites reviewed in this issue—are now owned by the same parent company. On May 31, McAfee Associates, the owner of BrightWorks, signed an agreement to acquire Saber Software Corp. for a reported \$40.6 million in stock.

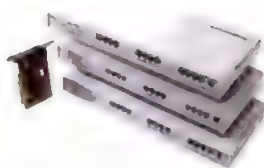
According to an International Data Corp. (IDC) study, McAfee controlled 10.3 percent of the integrated PC network management suite market prior to the agreement. Together with Saber's 30.3 percent share, however, this figure jumps to over 40 percent—giving McAfee the largest slice of the network management suite market in the United States. The rest of the market rounds out with Intel at 30.1 percent, Symantec at 20 percent, and several other

vendors—including Frye Computer Systems (a winner of multiple Editors' Choices, which sells its products as separate modules, not as a suite)—sharing the last 9 percent. Sources at Saber cite the combined market presence of the two companies as the prime motivating factor behind the deal.

According to McAfee, both BrightWorks (which was acquired when McAfee bought Brightwork Development last year) and Saber LAN Workstation will continue to be sold as separate products. In fact, the next versions of each product, BrightWorks 3.0 and SLW 6.0—due out near the end of 1995—will also be sold separately. As we went to press, no announcements had been made with regard to McAfee's 1996 plans for the two products.—Cade Metz



ASANTÉ FAST ETHERNET



*Crash-proof migration
with auto-negotiation*

*Single solution for
PC/Mac platforms*

*First stackable
100Base-TX hub*

TODD STILL TRAVELS THE SAME TWISTED PATH, ONLY NOW A LOT FASTER.

He sits in front of the same computer, connected to the same server by the same twisted-pair cabling. Only now, Todd's files scream through the net at 100 million bits per second. He's discovered AsantéFAST, the most cost-effective, high-speed Ethernet solution for work group connectivity. AsantéFAST 100 stackable hub and 10/100 PCI cards let you handle more traffic and big-bandwidth applications. And with NWAY™ auto-negotiation support, your network is virtually crash-proof. If there's one thing Todd knows, it's that speed is life when you're on the network. For more information on our Fast Ethernet primer, call us at (800) 662-9686. We'll get you up to speed. Faster than ever.

Asanté Technologies, Inc., 821 Fox Lane, San Jose, CA 95131, Tel: (408) 435-8388, E-Mail: sales@asante.com, Faxback: (800) 741-8607, Internet home page: <http://www.asante.com>.

Resellers: Asanté products are available from Gates/Arrow, GBC/Vitek, Globelle, Ingram Micro, Intelligent Electronics, Mermel, MicroAge, and Tech Data.

© 1995 Asanté Technologies, Inc. All brand names and products are trademarks or registered trademarks of their respective holders.

"What's a Wollongong?"

You've never heard of Wollongong? Edgar has. For 15 years, we've been providing TCP/IP-based Internet-working solutions for some of the world's largest companies. And we've been helping customers connect to the Internet since 1983. Now at Wollongong, we're focusing our expertise to bring the Internet to users like you, who perhaps don't share Edgar's enthusiasm for technological challenges.

**http:// DNS URL
blah blahblah html: W
blah FTP blahblah oh ye
and IPX blah CDIs and
servers IP addresses blah
Web browser SMTP or POP
WAIS Protocol-dependent
browse blah HyperText
blah API MIME browse
OLE domain name
blahbla**



WWW bl
ah, TCP/IP
AQs UNIX
BLAHblahblah
B mail blahb
BLAHblahbla
WINSOCK bl
some more
e XOVR
a.

Yes. **click.**

Emissary

From Wollongong makes working with the Internet as easy as clicking your mouse. It's a killer app that lets you browse, get files, surf the net, and read newsgroups—all with the point-and-click simplicity of Windows. So there are no protocols to worry about. No acronyms. No tricky commands. No hassle. In fact, with Emissary, navigating the net is as easy as using a Windows file manager. Emissary is the world's first Internet software that does for the Internet what Windows did for DOS. Finally, Internet for the rest of us.

To see what we mean, try out our
demo beta—<http://www.frog.com>.
Or call 1-800-872-3649, Dept. 30.

WOLLONGONG

Email: pctake@wpg.com U.S. Fax: (415) 982-0286 Canada: (519) 747-0900 Canada Fax: (519) 747-0902
CIRCLE 169 ON READER SERVICE CARD

PRINT SERVERS

HP's Three-Port Wonder

By Tony Pompili

Hewlett-Packard Co.'s new HP JetDirect EX Plus3 offers everything you could ask for in a print server, with three printer ports and support for multiple protocols, as well as powerful management software and friendly client software. You get all this for only about \$130 more than you'd pay for a single-port HP JetDirect EX.

The Plus3, which looks just like the single-port HP JetDirect, supports IPX, TCP/IP, and AppleTalk. The tiny device is available in both Ethernet (\$529) and Token-Ring (\$729) versions and has both BNC and RJ-45 LAN ports. A pair of LEDs on the box display network connection status and activity.

For management, the Plus3 comes with HP JetAdmin, a well-rounded printer configuration utility, which is included with all HP print servers. The Plus3 also comes with HP's JetPrint client software, which effectively replaces Windows' Printer Control Panel utility on your client PCs.

JUST PLUG IT IN

Installation of the Plus3 hardware is quick and painless. You simply connect the Plus3 to the network and a power source, and then turn it on. The product automatically senses and configures itself for the frame type that your network uses.

The management software is just as easy to install. JetAdmin loads quickly and provides a host of useful printer management tools.

JetAdmin is particularly useful for NetWare 3.12 environments, in which it allows you to create print queues, assign servers to the queues, and name printers without ever running NetWare's PCON-

SOLE print configuration program. NetWare 4.1 shops, however, will still have to use PCONSOLE, because JetAdmin does not yet include native support for NetWare Directory Services (NDS). For both NetWare 3.x and 4.x, JetAdmin lets you tinker with lower-level settings, such as frame types, as well as the Plus3's IP address and subnet. Also, according to HP, JetAdmin will be bundled with Microsoft Windows 95 when it ships. At the time of this review, JetAdmin was available for NetWare, LAN Server Advanced, Unix, and Windows 95.

The HP JetDirect EX Plus3 also supports Microsoft Windows NT Server 3.5 DLC print-

supporting network printing for Windows clients. JetPrint lets you configure your client printing system by allowing you to select network and local printers, assign printer drivers, and monitor printer queues. JetPrint also lets network administrators stay ahead of the driver update curve by granting JetPrint users access to a common set of network-based printer drivers. In other words, you no longer have to trudge from one PC to another updat-

ing printer drivers. Instead, you can just change JetPrint's common driver on the network and every JetPrint station will automatically switch over to the most current driver.

HP JetDirect EX Plus3. List price: Ethernet version, \$529; Token-Ring version, \$729., Hewlett-Packard Co., Direct Marketing Organization, Santa Clara, CA; 800-752-0900; fax, 800-353-1817; Web, <http://www.hp.com>.

Circle 972 on reader service card



PICK A PORT, ANY PORT: The Plus3 gives you the flexibility to connect multiple printers to a single print server.



MULTILINGUAL: The Plus3 supports just about every major protocol you might need.

ing, but only on one of the unit's three ports.

For TCP/IP sites running HP-UX, SunOS, or SunSoft Solaris, an optional Unix version of JetAdmin (\$199) replaces the common Unix printing system (LPD) with HP's proprietary system. The Unix LPD printing system is also supported, however, for users who would rather stick with the basics.

As far as Macintoshes are concerned, there really is no configuration to worry about. You simply put the Plus3 on the network and it appears on any Mac client running Apple System 6.x or 7.x.

KEEP THOSE DRIVERS CURRENT

With the latest release of its client software, JetPrint, HP has addressed the hassles of

NETWORK ANTIVIRUS SOFTWARE

Bundle Up to Keep Viruses at Bay

By Tony Pompili

What happens when you combine three antivirus packages into a single product? You get Symantec Corp.'s new Norton Anti-Virus (NAV) for NetWare 2.0, a loosely integrated set of powerful antivirus utilities that's difficult to install but costs \$1,700 less than you'd pay for the individual components.

NAV 2.0 is made up of several programs, each of which was previously available as a separate product. On the server, NAV for Networks (NAV-Net) runs as an NLM. Each client runs the basic NAV 3.0

software (which is still available as a standalone product). Finally, NAV Network Manager lets you manage this whole setup.

Using the NAV client software with NAV Network Manager, you can configure client startup scanning options and automatically update virus lists in a single shared location on the server.

Additionally, NAV for NetWare 2.0 adds native support for NetWare 4.x's NetWare Directory Services (NDS) and client support for Apple's Macintosh. Although it's nice to have all these fea-

Continues on page NE45

Server problems?

Just a reminder.

Stress kills.

Build a better server with Adaptec.

When the calls turn to pounding on your door and everyone is shouting, "We can't access our files!" You begin to wonder if managing server-based storage needs to be this hard.

Adaptec® will change the way you configure servers forever. We've taken I/O beyond



basic SCSI connectivity and addressed the key network storage concerns of: Manageability, Availability, Performance and Scalability.

The new Adaptec CI/O* remote monitoring and management software gives you insight into all SCSI devices connected to all of your servers. From a single server down the hall, to 100 networked servers across the world.

You'll also see increased performance with our new multichannel PCI-to-SCSI host adapters. The AHA®-3940 relieves bottlenecks by letting you spread drives across separate SCSI channels on a single card, taking full



advantage of your server's PCI performance. For improved data availability, the new AHA-3985 PCI RAID adapter makes RAID 5, 1, 0, or 0/1 all economically attractive for entry- and mid-range servers.

Call Adaptec at 1-800-934-2766 ext. 2225*. We'll send you information, a demo diskette of the Adaptec CI/O software and a booklet from the RAID Advisory Board. Then you can stop screaming and take the weekend off.

adaptec

I/O. NOW MORE IMPORTANT THAN EVER.



IF YOU'RE
UPGRADE

WAIT.

PLANNING TO YOUR NETWORK,

Before you plunge into your next network upgrade, you ought to consider your options. To be competitive today you need more from your network than file-and-print. You also need reliable access to mission-critical business information. You need Windows NT™ Server, the best upgrade option for your NetWare™ system. Windows NT Server is designed to fit right into your existing NetWare environment. So instead of rip-and-replace, you can add-and-augment. And get a powerful multipurpose network operating system that offers exceptional file-and-print capabilities, plus directory services, plus the ability to run more than 1,300 business applications. • As the foundation of Microsoft® BackOffice, Windows NT Server offers full support for robust {  } databases, host connectivity, messaging and systems management. With its advanced microkernel architecture, protocol independence, and consistent support for applications, Windows NT Server is the platform for networking and client-server applications. A combination that can serve your business well into the next century. • So if you're planning to upgrade your network, make sure you have the facts. (There are more than a few listed on your right.) Then contact your nearest reseller, or any of those listed below, for a 10-user Network Value Pak. Yours for only \$999 (\$839 for you NetWare upgraders). Need more details? Call (800) 434-3982, Dept. HUG.

MULTIPURPOSE SERVER

FAST FILE & PRINT
(PROTOCOL INDEPENDENT,
INCLUDING NETWARE)

GENERAL APPLICATIONS
(1,300 AT LAST COUNT)

DATABASES
(MICROSOFT, ORACLE®, SYBASE®)

COMMUNICATIONS
(DIAL-IN NETWORK ACCESS,
ISDN, SNA)

INTEGRATED MESSAGING

INSTALLATION & ADMINISTRATION

EXPRESS SETUP
(HARDWARE DETECTION
DRIVERS ON CD-ROM)

UPGRADE TOOLS
(NETWARE, LAN MANAGER)

DIRECTORY SERVICES
(CENTRALIZED ADMINISTRATION
SINGLE LOG-IN TO NETWORK)

DESIGNED FOR C-2 LEVEL SECURITY
(SERVER AND NETWORK)

OPEN PLATFORM

PROTOCOL INDEPENDENT
(TCP/IP, IPX/SPX, NETBEUI, DLC, ...)

NETWARE SUPPORT
(FILE & PRINT SERVICE,
GATEWAY SERVICE, IPX/SPX)

MACINTOSH® CLIENTS
(NO SPECIAL SOFTWARE REQUIRED)

UNIX® AND INTERNET
(FTP, DNS, WWW, GOPHER READY, ...)

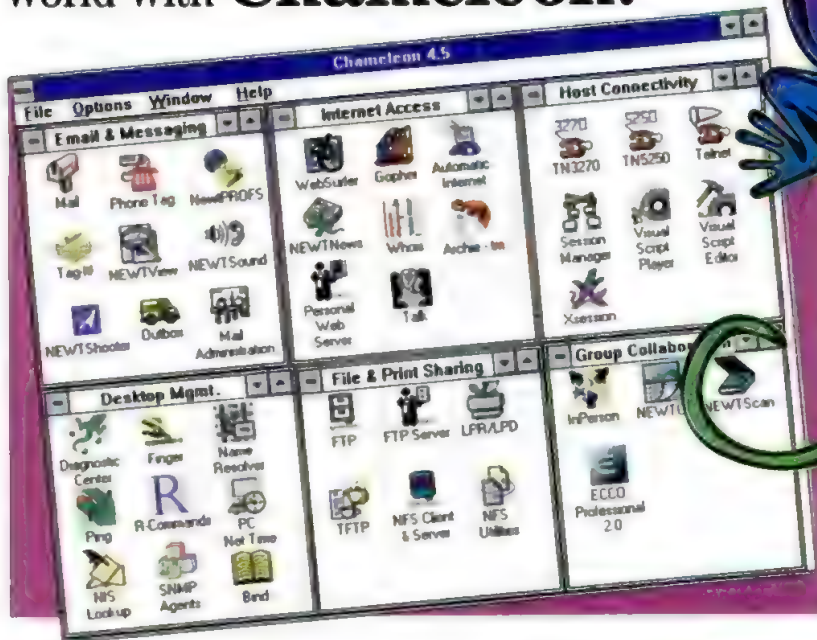
PROCESSOR INDEPENDENT
& SMP READY

(INTEL® DEC™ ALPHA AXP™
MIPS® R4X00 POWERPC™)

TCP/IP Applications For Windows.

Network Your Desktop To The
World With **Chameleon.**

**New
Version!
4.5**



BEST VALUE.

Chameleon is a TCP/IP Windows desktop that offers more applications than any other product. It provides you with a comprehensive Windows solution for TCP/IP networking.

SIX INTEGRATED SOLUTION SUITES.

Chameleon desktop applications are integrated for powerful cross-functional capabilities. Drag-and-drop any information on the network between applications at the click of a button.

SEAMLESS ACCESS TO CORPORATE INFORMATION RESOURCES.

Chameleon includes more applications that allow you to access

information on Unix, mainframes, minicomputers, PC-based LANs and WANs, and the Internet.

OFFICE, HOME, AND REMOTE NETWORK ACCESS.

Connect to your network and the Internet via LAN or dialup access with one easy-to-use software package. Send and retrieve email, download files, print documents, login to remote hosts, and run client/server applications. Connect your PC to the world with Chameleon.

NetManage Chameleon includes WinSock TCP/IP and is 100% DLL/VXD. Chameleon requires only 6KB memory and configures in just 5 minutes.

OVER 40 FULLY INTEGRATED APPLICATIONS INCLUDED:

Host Access
Telnet: VT100, VT220, VT320, TVI, Wyse, TN3270, TN5250, Visual Script Editor & Player, X Windows*

File & Printer Sharing
NFS Client & Server*
FTP Client & Server
LPR/LPD

Electronic Mail & Messaging
SMTP Mail with MIME
IBM PROFS
Phone Tag, Tag II
Calendar/Scheduler

Internet Access
WWW Client & Server
Gopher
Newsreader
Archie
Whos

Group Collaboration
ECCO Personal & Group Information Management*
InPerson Network Whiteboard

Desktop Management
Ping, Finger, Name Resolver
DNS Client & Server
R-commands
PC Net Time

TCP/IP Communications
Winsock
100% DLL TCP/IP Stack
LAN: Ethernet, Token Ring
Dialup: SLIP, CSLIP, PPP & ISDN
And More

*Optional

UPGRADE TO 4.5 FOR ONLY \$95!

NETMANAGE™

Network Your Desktop To The World

(408) 973-7171

e-mail: sales@netmanage.com

World Wide Web: www.netmanage.com



© 1995 NetManage Inc., 10725 North De Anza Boulevard, Cupertino, California 95014, U.S.A. Fax (408) 257-6405 U.K. +44 (0) 1483 302333
Israel +972 4-550234, Germany +49-8165-923 428, France +33-1-47 72 08 08. Specifications are subject to change without notice.
All trademarks are property of their respective companies.

CIRCLE 877 ON READER SERVICE CARD

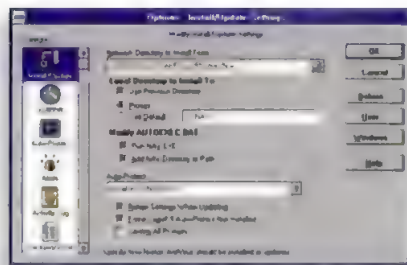
Symantec

Continued from page NE40
tures in one package, we were more impressed with the savings NAV for NetWare 2.0 provides over previous versions of its three components purchased separately: You pay almost \$1,700 less for a ten-user configuration.

All this bundling has created a product that's a little tough to get your arms around, however. For example, the installation is not very well integrated. We had to jump among three manuals, making small steps forward in the installation as we read. Network Manager's pamphlet tells you to install NAV Network Manager on the network and tells you to follow the instructions in the NAV 3.0 client Users Guide. The Users

Guide makes no reference to Network Manager and leads you through a local client installation. Much of the problem turns out to be inconsistent product-naming terminology; Symantec acknowledges and is attempting to correct this.

Once we installed the product, things improved. Configuring the server and client software (DOS and Windows software is available in both cases) is fairly simple and intuitive. You can set up immediate scans on the server, configure the types of files to be scanned, and set up scheduled scans. Also, NAV Network Manager lets you edit the shared NAV client configuration file and set such parameters as the file types to scan and the network address where infection notifications



ALL IN THE FAMILY: NAV sports an interface similar to other Symantec products.

should be received.

To keep you ahead of the antivirus game, Symantec continually updates its database of known viruses and viruslike behavior. You can download the database free from most on-line services as well as Symantec's BBS (503-484-6699 for 9,600 bps, 503-484-6669 for 14,400 bps) and Internet sites (<http://www.symantec.com> or <ftp.symantec.com>). Also, on

the ever-popular Microsoft Windows 95 side, Symantec expects to ship a 32-bit client version of NAV when the new operating system ships.

Once we had installed it, Norton AntiVirus for NetWare proved to be a powerful, full-feat-

ured network-virus-protection solution for NetWare-based LANs. A better installation process, including significantly improved documentation, would make this an even stronger product.

Norton AntiVirus for NetWare 2.0. List price: 10-user license, \$599. Symantec Corp., Cupertino, CA; 800-441-7234, 503-334-6054.

Circle 969 on reader service card

THE NETWORKER By Diane Danielle

Spread the Risk



All-purpose, scalable NOSs and servers are in. Separate servers for separate functions are out.

This trend makes me uncomfortable, because I believe it to be incompatible with the primary objective of good network management: service availability. Though improvements have been made in server reliability, the more separate components a server needs to support various functions, the more often it will be unavailable.

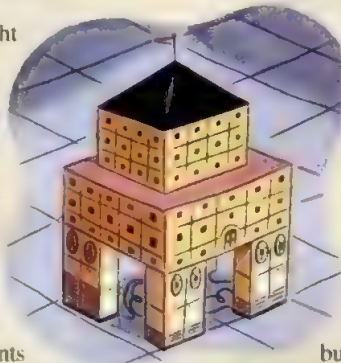
If installation were a one-time deal, it might not be so bad. But though installation may occur only once, maintenance is ongoing. Think about a server that contains a network hub plus boards for SNA connections, asynchronous communications, telephony, and backup. How often will you need to upgrade or replace one or more of those components during the server's lifetime?

And what happens when you get a new software upgrade for one of those components? What if the upgraded driver doesn't like your configuration? The more components you're supporting, the more often you'll be faced with upgrades and related downtime. Worse are the unscheduled downtimes, when something goes wrong with your WAN link or your SNA gateway. Can you afford to take down your server for the necessary troubleshooting?

In general, I prefer to use separate, dedicated servers for dif-

ferent functions. That way, I can provide continuing access to accounting and database applications even if users can't get to the mainframe. I can provide WAN connectivity even if I can't give them database access.

What about cost, though? General-purpose servers are most popular in branch offices, where an additional one or two computers times 10 or 1,000 sites can quickly add up to *big* bucks. But branch offices, especially those without system staff or remote-control capabilities (and you'd be surprised how many there are) add one more wrinkle to the support conundrum. Do you really want to walk an accountant through the steps needed to bring up a WAN link that has crashed on a server running other critical applications? I'd rather accountants and graphic artists not get anywhere near a multipurpose server.



The more critical your network's functions, the more careful you should be about putting all your eggs in one basket. The less critical, of course, the smaller the risk. If there is no economic alternative to a general-purpose server—I do understand budget battles—at an absolute minimum, keep spare components on hand so you can swap parts quickly. Even better, keep an identically configured server available for testing maintenance releases and as a standby for problem solving. Use mirrored servers for critical sites: They won't save you from software faults, but they will protect you from hardware failures.

When the day comes that we can add and remove components to a running server, I may change my mind. Until then, however, I prefer to spread the risk.

Diane Danielle, an independent networking consultant, can be reached on CompuServe at 72241,2566 or MCI Mail at 383-1159.

Remote PC-to-LAN Dial-up

TAKE THE DESKTOP ON THE ROAD.

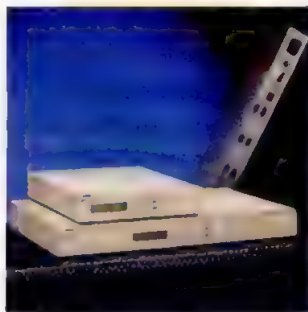


Perle 833

Remote

Access

Server



Remote users need LAN dial-up access? The Perle 833 brings cost-effective remote access to your LAN from just about anywhere on the map. You'll get great performance, too! Standard features of the Perle 833 include:

- fast RISC architecture
- ISDN support for high-speed, low-cost data transfer
- port speeds of up to 115 Kbps
- available in 2, 4, and 8-port models to match your dial-up traffic.

Ideal for client/server applications and more! Remote DOS/Windows PCs appear as though they are a node on the Ethernet LAN, with all LAN resources available to the remote PC, including databases and e-mail. Even remote LAN administration is possible with the Perle 833. For reading and writing large blocks of data, simply launch a remote control session—popular third-party remote control software packages supported.

Secure your LAN. With four levels of security available, the Perle 833 is well-equipped to handle the most stringent security requirements.

Low-cost installation and maintenance. Easy set-up frees your time for more critical tasks, and configuration, monitoring, and software upgrades can be performed remotely, cutting travel and lost productivity.

Assistance just a call away. Help with installation and on-going operation is available, **at no charge**, by simply dialing Perle's responsive Customer Assistance Group.

Get LAN dial-up access NOW!

For more information call:

1 800 GO PERLE

Please mention Response Code AD2H097.

Map © 1991 by Rand McNally, R.L. 95-5-68.

CIRCLE 928 ON READER SERVICE CARD

PERLE and the Perle logo are registered trademarks of Perle Systems Inc.; Perle 833 is a trademark of Perle Systems; AS/400 and OS/2 are registered trademarks of International Business Machines Corporation; Windows is a registered trademark of Microsoft Corporation; NetWare is a registered trademark of Novell Inc. "Yes It Runs With NetWare" developer tested only. Novell makes no warranty with respect to this product. Other product names are registered trademarks or trademarks of their respective holders. Copyright © 1995 Perle Systems Inc. Map © 1991 by Rand McNally, R.L. 95-5-68.

PERLE

PERLE SYSTEMS INC.

PERLE SYSTEMS INC.

PERLE

Perle Systems Inc.
1-800-467-3753
1-708-789-3171

Outside the US:

■ MEXICO (915) 628-1215
■ COLOMBIA (571) 296-0075
■ CANADA (905) 475-8885
■ EUROPE (UK) +44 1908 261251
■ SINGAPORE +65 222-6272
■ AUSTRALIA (02) 416-0650
■ JAPAN +813 5275-2476



New & Improved

NEWS OF ANNOUNCED PRODUCTS AND UPGRADES

By Leslie Wygant

Pac Bell and Ascend Join In ISDN Package

Even though ISDN is becoming well known throughout the computer industry and business world, many businesses find it difficult to implement ISDN connections. **Pacific Bell** and **Ascend Communications** offer the Internet NOW program, which provides high-speed access to the Internet with an all-in-one solution. Internet NOW includes Pacific Bell's FastTrak ISDN lines, Ascend's Pipeline 50 ISDN remote-access router, and an account with an Internet service provider. Internet NOW waives all installation fees if you commit to the program for two years.

Internet NOW. Monthly charges for ISDN service and router; separate charges for Internet account. Pacific Bell, Los Angeles, CA; 800-366-4058; e-mail, inetnow@inter-serv.com.

Circle 959 on reader service card



WATCH IT: Caravelle's Watcher II includes SNMP and NetWare server monitoring.

Watcher II Adds SNMP And E-Mail Support

It's tough to find inexpensive network management tools. **Caravelle** has announced Watcher II, which offers complete network management beginning at under \$500. Watcher II includes SNMP object monitoring and NetWare server monitoring. It also offers e-mail capabilities for MAPI, cc:Mail, and SMTP systems. Watcher II alerts you to any possible problems via console screen, pager, and e-mail.

Watcher II. List price: \$499. Caravelle Networks Corp., Ontario, Canada; 613-225-1172; fax, 613-225-4777; BBS, 613-225-1380; e-mail, caravell@magi.com.

Circle 961 on reader service card



Another Way to Use the Internet from Tribe

Tribe Computer Works is giving you yet another way to use the Internet: management of network devices. Tribe's WebManage software will be included at no cost with Tribelink wide-area routers and remote-access servers. WebManage enables you to set up and configure your Tribe products by connecting to the Tribe site over the Internet.

Once you're set up, WebManage gives you a view of your Tribelink product. Its ROM-based home page allows you to hypertext between setup and troubleshooting help. Views can be customized, and password protection provides a high level of security.

Currently, WebManage works only with Tribe's new multiprotocol remote-access server, Tribelink2. Tribe plans to help other networking vendors implement their own Web-based management systems as well.

Tribelink2 supports TCP/IP and AppleTalk over PPP, and you can an upgrade to an IPX-compliant server.

WebManage. List price: Free with Tribelink wide-area routers and remote-access servers. **Tribelink2.** List price: \$1,295. Tribe Computer Works, Alameda, CA; 800-778-7423, 510-814-3900; fax, 510-814-3980; e-mail, sales@tribe.com; Web, http://www.tribe.com.

Circle 957 on reader service card

CompuServe Provides Internet, LAN, and WAN

If you want to access information on the Internet and on your network, you used to need two applications. Now all you need is Internet Office 4.0, from **CompuServe's** new **Spry Internet Division**; it offers Internet, LAN, and WAN access. Four separate Internet Office products will be available: Internet Office Professional (which includes Unix and mainframe connectivity software), Internet Office Professional—Rumba Edition (which includes Wall Data's enterprise-wide connectivity software), Internet Office Navigator (for navigating the Internet over your network or modem), and Internet Office Mosaic (for browsing the Web).

Internet Office 4.0. List price: \$49 to \$499 per user. CompuServe, Spry Internet Division, Seattle, WA; 800-777-9638; Web, http://www.spry.com.

Circle 960 on reader service card



HOOK IT UP: The Cisco 2517 Router/Hub links a Token-Ring network to the Internet.

Cisco Connects Token-Ring to the Internet

Cisco Systems has joined with LanOptics to offer a solution for linking a single Token-Ring network to either the Internet or a larger corporate network. The Cisco 2517 Router/Hub combines Cisco's routing technology and LanOptics' Token-Ring hub media technology to give you all you need for connecting to both the Internet and a wide area network. You get a Token-Ring Media Access Unit (MAU) concentrator, an SNMP controller, an Internet router, and an ISDN terminal adapter.

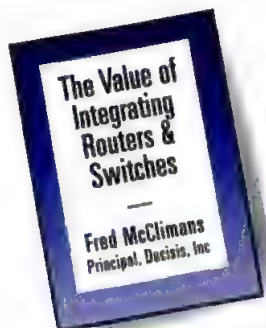
Cisco 2517 Router/Hub. List price: \$5,995 to \$7,995. Cisco Systems Inc., San Jose, CA; 800-553-6387, 408-526-4000; fax, 408-526-4100.

Circle 965 on reader service card

A real pro

can perform anywhere

True interoperability
and reliability make
the RBX 200 the winner
in remote routing.



Call us at
800-545-7464
for a free
guide on
remote access
solutions.

The OpenROUTE to IP

It all starts with IP. If a remote router can't do it right, there's trouble ahead. Our market-proven IP sends your data via the shortest, most economical and secure paths available. And reroutes it as conditions change. So information gets where it needs to go without delay or degradation. And our Bandwidth Reservation and WAN

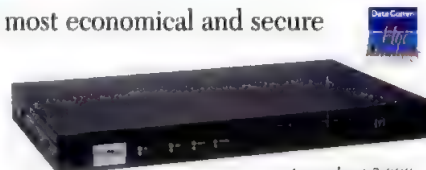
Restoral ensure your data gets through. It's all part of Proteon's OpenROUTE™ internetworking software, the most interoperable ever put in a remote router. In fact, we guarantee it will work with your network*.

A better way to run SNA

The RBX 200 is also available with our award-winning implementation of Data Link Switching (DLSw) so you can carry SNA traffic across TCP/IP – reducing communications costs up to 50%.

Easy does it

Just as important, installing the RBX 200 in remote sites is so easy, anyone can do it. And you can configure and manage it from headquarters. So call Proteon at 800-545-7464 or your reseller. And learn how the RBX 200 can perform for you.



At under \$2,000, the award-winning RBX 200 provides more functionality at less cost than any remote router available.

proteon network
with the pro™

*If not satisfied, return the RBX 200 within 30 days of purchase for a full warranty refund. Call 800-545-7464 for full terms of our limited warranty.

CIRCLE 929 ON READER SERVICE CARD

© 1995 Proteon, Inc.

New & Improved

CU-SeeMe for Internet Videoconferencing

In the very near future, you won't need fancy equipment to use videoconferencing. **White Pine Software** has teamed up with the Cornell Research Foundation to announce CU-SeeMe technology, which offers connections for two-way video over the Internet or any TCP/IP-based network. White Pine plans to offer a commercial version of CU-SeeMe by the end of 1995. A free version of CU-SeeMe is currently available on White Pine's FTP site and Web home page.

CU-SeeMe. List price: Free; current version can be downloaded from <ftp://CU-SeeME.cornell.edu/pub/CU-SeeME> or on the Web at <http://www.wpine.com/cuseeme.html>. White Pine Software Inc., Nashua, NH; 603-886-9050; fax, 603-886-9051; Web, <http://www.wpine.com>. Circle 966 on reader service card

BRIEFS

Network TeleSystems has added PPP support and Internet access to its TCP Pro software line. TCP Pro 2.0 includes TCP Pro Enterprise (\$299), TCP Pro Remote (\$179), and TCP Pro Internet (\$99).

ANNOUNCEMENTS

3Com Corp. has cut prices for its Fast Ethernet products. 3Com's FastEtherLink PCI adapter is now \$195 (per adapter for 20 adapters). The LinkBuilder FMS 100 hub is now priced at \$199 per port. The LinkSwitch 1000 is now \$199 per port. 3Com has also developed the FastStart program, which offers a free LinkBuilder FMS 100 12-port hub with the purchase of 30 or more Fast EtherLink 10/100 adapters. 408-764-5000.

CMS Connects Microsoft Mail to the Internet

Network administrators who need an SMTP gateway from Microsoft Mail to the Internet now have an alternative to Microsoft's solution: **Computer Mail Services' S-Bridge NT** for Microsoft Mail. S-Bridge NT currently works only with MS Mail but eventually will support Lotus's cc:Mail and Novell's MHS. S-Bridge NT allows you to use Windows NT's administration features, such as event logging, multitasking, and multithreading. To ensure reliable message transmission, S-Bridge NT will notify a sender that the correct host has received a message.

S-Bridge NT for Microsoft Mail. List price: With 15-user license, \$495; 10-user upgrade pack, \$195. Computer Mail Services Inc., Southfield, MI; 810-352-6700; fax, 810-352-8387; e-mail, 178.2059@mcimail.com.

Circle 967 on reader service card

MULTIPLE ACCESS By Steve Buehler

Simpler Rocket Science



I was wandering through our Labs in Foster City, California, recently when I heard Jeff Witt, *PC Magazine's* Connectivity Team project leader, muttering over a test bench. The softly spoken words I heard were "What were they thinking of—rocket science?"

The object of these ponderings turned out to be some of the remote-node servers reviewed in this issue—in particular servers from vendors that are missing the opportunity to make life easy for their users. As your users demand telecommuting and remote access, this means you will pay the price for the oversight when you try to set up these servers.

During our testing, we found that these products separated into three tiers. The first tier is turnkey servers, including Shiva's LanRover/E PLUS 3.5, our Editors' Choice. Shiva and several other vendors have paid attention to minimizing the number of steps a user needs to take to get up and running. Since many people run NetWare, a typical user should be able to install the hardware, plug the server into the network, and set up and manage the server within 30 minutes of opening the box. Not exactly rocket science, even if it is networking. In the middle tier, products such as Stampede's Remote Office Communications Server—a card you install in your own PC—did not show the installation forethought of the LanRover or

3Com's AccessBuilder 2000. But since you're aware when you buy the Remote Office that you have to install it yourself you probably know what to expect.

At the other end of the ease-of-use galaxy, though, were the products that look like bridges or routers with added async ports. While this is a legitimate approach, the implementations were light-years behind our Editors' Choice. Why, for example, do these vendors require you to have a terminal to set up a remote-node server? This type of product is designed to talk to the network—vendors should let it use the network for setup and management. We don't all have terminals and the proper cabling (9 or 25 pins? which gender?) sitting around, nor should we need to string gender changers and adapters across the room as the PC Labs staff did.

And why does a vendor provide only a clunky terminal interface for setup and configuration? Two of the router-like products (Telebit's NetBlazer PN4DE and Cisco's 2509 Access Server) had cryptic command line interfaces that were alien to the Windows GUI most users use and that lots of network administrators accept. Worse, some of the docs for these interfaces were just plain wrong or missing; there is no excuse for that. While the vendors are at it, why not have the product read the NetWare Bindery to ease setup (as the LanRover and Xylogics' Remote Annex 2000 do)? If the product is already talking to the network, why make the installer's task more difficult than necessary?

Remote-node access is where the worlds of high-end routers and low-end access are colliding—and it's time the router vendors follow the example of Shiva. Vendors should demystify the rocket science of remote-access networking, or be left at the launching pad. □



IT'S THE MOST COMPLETE INTERNET SOLUTION ON THE PLANET.

Explore OnNet 2.0 for Windows

**ALL THE POWERFUL,
EASY-TO-USE FEATURES
YOU'LL NEED TO MAKE THE
MOST OF THE INTERNET.**

Explore OnNet is packed with Windows applications that take the time and trouble out of accessing and utilizing everything the Internet has to offer. Send

and receive e-mail, including word processing and graphic attachments which Explore can display in full view even without the originating applications. Jump on the net *fast* using Launcher with its graphical user interface. Navigate the Web with an

enhanced Mosaic browser. Even cut on-line costs using Dial-on-Demand with its automatic connect and disconnect feature. No other Internet solution makes you as productive.

**CALL 1-800-863-4548
FOR OUR FREE
INTERNET STARTER KIT.***

Offer expires 9/1/95.
*Includes the book *Exploring on the Internet*
and browser diskette.



- Email (NINE & MAPI)
- FTP
- Mosaic 2.0
- ISDN Support
- Internet Relay Chat
- Registration Wizard & Instant Internet Access
- Telnet
- Gopher
- Launcher
- Dial on Demand
- File Viewing & Conversion

**1-800-282-4FTP
ext. 425**

e-mail: info@ftp.com

WWW: <http://www.ftp.com>



**Complete Solutions
For Internet Computing.**

FTP Software, 100 Backstone Square, Andover, MA 01810 (508) 685-3300

OnNet and the GO ANYWHERE logo are trademarks and PC/TCP is a registered trademark of FTP Software, Inc. Other tradenames, trademarks, or registered trademarks are the property of their respective holders.

CIRCLE 861 ON READER SERVICE CARD

The best stack to switch.



The best switch to stack.

TIGERSTACK + TIGERSWITCH

You know you need stackables to lower costs, and switches to increase bandwidth. But did you know you can get the best of both in a single solution?

TigerStack lets you build workgroups up to 224 users, and create up to 32 independent Ethernet segments, to allocate bandwidth where it's needed most. Then, you can interconnect segments at full wire speed with **TigerSwitch**, which combines the price/performance of ASIC switching with the flexibility of RISC processing—for very low latency and 0% packet loss.* And to make life easy, you can control the whole solution from a single management application.

TigerStack and TigerSwitch. The best solution for networks on the growth path.

Stack and Switch. \$99 per port.

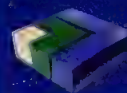
The industry's best stack/switch solution also has the industry's best price. Call today and ask for Dept. TS31. We'll give you details on this special offer, and send you highlights of Strategic Networks Consulting Inc.'s switching test results featuring proof of TigerSwitch performance.



SMC
1-800-SMC-4-YOU

*April 1995, Strategic Networks Consulting, Inc.

All trademarks and registered trademarks are the properties of their respective holders. ©Copyright 1995 Standard Microsystems Corporation.



Solutions for:

LAN Access:

LAN Access:

Ethernet Adapters

Fast Ethernet Adapters

Token Ring Adapters

Portable Connectivity

Ethernet Hubs

Token Ring MAUs

Bandwidth Acceleration

Ethernet Switching

Token Ring Switching

Stackable Hubs

Intranetworking

Backbone Solutions

Fast Ethernet Solutions

Multiprotocol Switching

ATM, HSSI, FDDI



STOP

DON'T MISS THIS CHANCE TO GET FREE NETWORKING PRODUCT INFORMATION!

Get the information you need from products featured in our Network Edition section with our fast access inquiry card. Just tear it out, even use it as a bookmark and circle as you GO. You can FAX it too. It's that easy. Look for this card located near the back of this issue.

**PC
MAGAZINE**

FREE PRODUCT INFORMATION

It's the quick and easy way to get detailed information mailed directly from the manufacturer, free of charge.

- CIRCLE the numbers that correspond to the item(s) about which you'd like more information
- CHECK OFF your answers to the questions below
- FAX your request to (609) 829-0692 or mail this card and we'll pay the postage!

VOID AFTER
12/31/95

PRODUCTS FEATURED IN NETWORK SECTION

PRODUCTS FEATURED IN NETWORK SECTION

820	821	822	823	824	825	826	827	828	829	830
831	832	833	834	835	836	837	838	839	840	841
842	843	844	845	846	847	848	849	850	851	852
853	854	855	856	857	858	859	860	861	862	863
864	865	866	867	868	869	870	871	872	873	874
875	876	877	878	879	880	881	882	883	884	885
886	887	888	889	890	891	892	893	894	895	896
897	898	899	900	901	902	903	904	905	906	907
908	909	910	911	912	913	914	915	916	917	918
919	920	921	922	923	924	925	926	927	928	929
930	931	932	933	934	935	936	937	938	939	940
941	942	943	944	945	946	947	948	949	950	951
952	953	954	955	956	957	958	959	960	961	962
963	964	965	966	967	968	969	970	971	972	973
974	975	976	977	978	979	980	981	982	983	984
985	986	987	988	989	990	991	992	993	994	995
996	997	998	999							

Networking/Internet
working

1. Do you want to receive
more information on any of
the following products? please
check the appropriate boxes

2. Do you want to receive
more information on any of
the following products? please
check the appropriate boxes

3. Is your company
a reseller?

4. Number of employees
in your entire company

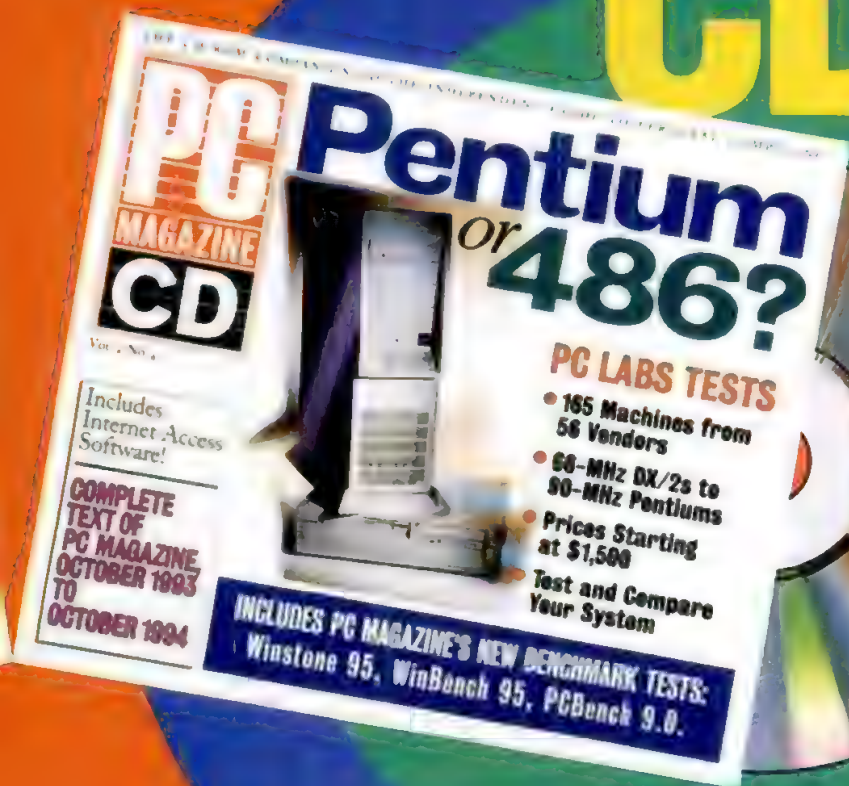
5. Please send me the information you have requested. I understand that you will charge me \$36.00 for each additional request.

GO

INTRODUCING THE CD-ROM THAT
PUTS A WHOLE NEW SPIN ON YOUR PC;

PC MAGAZINE

CD



YOU'VE
NEVER SEEN
ANYTHING
LIKE IT!

It's one thing to read about cutting-edge technology. It's another thing to plug right into it. Interact with it. Download it onto your system and play with it. That's exactly what PC MAGAZINE CD lets you do — and more.

Just one click and this interactive companion will let you:

- Walk through multimedia ScreenDemos that bring our Cover Stories to life. Hear and see the pros and cons of the entire

competitive line-up right before your eyes.

- Put your system through its paces. Download PC Bench 9.0, WinBench 95 and Winstone 95 to chart and compare every aspect of your PC's performance.
- Get working samples of real applications to run on your system. You can even take a "First Look" at products before they hit the market.
- Access the full text of every article that appeared in PC Magazine in the past 12

months — including every utility, file, tip, shortcut and patch we've published. Dynamic "Super Searching" software lets you find what you need instantly.

PC MAGAZINE CD is a powerful tool that enhances the help you get from PC Magazine. Join us as a Charter Subscriber to PC MAGAZINE CD today.

FOUR POWER-PACKED QUARTERLY RELEASES JUST \$49.95. Save 30% off the single-disc price!

CALL TO ORDER NOW! 1-800-335-1195 SUPPLIES ARE LIMITED

Mention Priority Code: 4M07

Toll free number is available in the United States and Canada. Other countries, call 303-694-1464 or FAX your order to 303-694-7455.

SYSTEM REQUIREMENTS: 386 or higher PC-compatible system, Windows™ 3.1, 640 RAM, CD-ROM drive. Windows-compatible sound board recommended for some functions. PC Magazine CD is \$72 in Canada (includes Canadian GST and shipping charges), \$99 for all other foreign orders (includes air mail charges). The U. S. single copy price of PC MAGAZINE CD is \$17.95.

PC MAGAZINE CD • P.O. Box 50484 • Boulder, CO 80322-9484

HARDWARE

Communications Devices.....	NE55
Diagnostic/Management/Test.....	
Hubs/Routers/Bridges	
Network Interface Cards	
Mass Storage/Network Backup	
Power Supplies/UPS	
Printers/Print Devices.....	
Systems/Servers	

SOFTWARE

Diagnostic/Management/Test.....	NE55
Networked Applications	

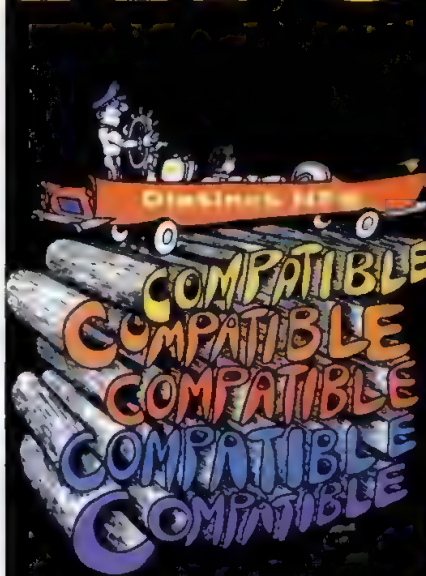
SERVICES

Consultants/Systems Development.....	
Network Data Backup/Recovery.....	
Vars/Systems Integrators	

MISCELLANEOUS

Cables/Wiring/Connectors.....	
-------------------------------	--

Distinct NFS



Runs over
Distinct® TCP/IP,
Microsoft®
TCP/IP and
Novell® LAN
Workplace

- Allows files and printer sharing across multiple platforms
- Works in Windows® Windows for Workgroups and DOS boxes
- Implemented as a VxD
- Client and server
- Includes Windows Sockets

distinct

Email: mktg@distinct.com
Fastfacts: 408.366.2101
Fax: 408.366.0153
Phone: 408.366.8933

CIRCLE 820 ON READER SERVICE CARD

MAKE THE SWITCH!

Manage your entire computer system...from just one keyboard!

The Apex DeskTop Concentrator allows you to access & control up to 64 systems from single keyboard, monitor & mouse.

Make the call: 1-800-861-5858

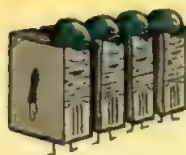


Apex PC Solutions, Inc. 4580 150th Ave. NE Redmond, WA 98052
(206) 861-5858 Fax: (206) 861-5757



Control up to 96 file servers with just 1 keyboard, monitor and mouse!

- Works with all 100% IBM compatible PCs; built-in support for both PS/2-style and serial mice
- KeyScan™ feature for keyboard-controlled scanning
- Add a second control center up to 150 feet away
- AutoBoot™ feature boots computers without operator intervention
- Each unit controls from 2 to 8 PCs; supports up to 12 units in all



**AUTOBOOT™
COMMANDER**

For both Macintosh and Sun support, please ask about our AutoBoot Commander 4xP!

Cybox Corporation
4912 Research Drive Huntsville, AL 35805 USA
(205) 430-4000 (205) 430-4030 fax



Cybox, AutoBoot, Commander, 4xP and KeyScan are trademarks of Cybox Corporation. All other trademarks and registered trademarks are the property of their respective owners.
Dealer Program Available **Made in USA**

CIRCLE 821 ON READER SERVICE CARD

SALES

“PC Magazine Premier advertising works for us. We're advertising to sell off the page. In Premier that's what our ad does!”



—Mike McCoy
President
Advanced Digital Systems

PUT YOUR AD HERE AND WRITE YOUR OWN PC MAGAZINE SUCCESS STORY. START ADVERTISING NOW! CALL 800-825-4237 TODAY!

INSTANT INTERNET™

Connect **NetWare** To The Internet In Under 1 Hour*

Instant Internet provides network-wide Internet access —without loading TCP/IP on any workstations or servers.

Key Benefits of Instant Internet

- **Security:** A hardware firewall protects your LAN resources
- **Quick installation:** All LAN workstations can be connected in less than one hour
- **Turn-key solution:** Hardware, software, and apps bundled
- **WINSOCK-compatible:** Runs any WINSOCK application
- **Low price:** One price provides up to 50 concurrent sessions supporting LANs with over 200 PCs
- **Low maintenance:** All PCs share one TCP/IP address
- **Built by LAN experts:** Over 10 years of networking experience with award-winning products such as POWERLan, POWERSave, and POWERfusion

* Must have an Internet connection through a recognized service provider

"the perfect out-of-the-box network Internet connection."

Computer Reseller
News, 5/22/95

"Instant Internet's simplicity and security make it a sure choice for Internet access in NetWare LANs."

PC Magazine, 5/30/95

"No other product I've tested can duplicate the immediate gratification of Instant Internet."

Information Week, 5/8/95



(800)PT-IINET
(800)784-4638

email: info@instant.net
home page: www.perftech.com

PERFORMANCE TECHNOLOGY

CIRCLE 867 ON READER SERVICE CARD

Network Edition Advertisers Index

Reader Service No.	Advertiser Telephone / Web Address	Page
910	3M Data Storage Products	14-15
934	Adaptec	NE41
	800-943-2766 / www.adaptec.com	
902	Asante Technologies	NE37
	800-622-9686 / www.asante.com	
898	BayNetworks	NE18-NE21
	800-BAYNET	
930	Digital Equipment Corporation	NE24
	800-STORWORK	
861	FTP Software Inc.	NE51
	800-282-4FTP / www.ftp.com	
870	Funk Software	NE12
	800-828-4146	
*	Hewlett Packard	NE32-NE33
	800-533-1333	
*	IBM Corporation	NE28-NE29
	800-IBM-3333 x J4113 www.raleigh.ibm.com/netad.htm	
*	Intel Corporation	NE11
	800-538-3373 www.intel.com	
859	Micro Solutions Computer Products	450
855	Micro Solutions Computer Products	451
924	Micron Computer, Inc.	NE2-NE3
	800-438-3343	
*	Microsoft	NE14-NE15
	800-426-9400 www.microsoft.com	
*	Microsoft	NE42-NE43
	800-426-9400 www.microsoft.com	
877	NetManage, Inc.	NE44
	800-973-7171 / www.netmanage.com	

Reader Service No.	Advertiser Telephone / Web Address	Page
*	Novell, Inc.	NE8-NE9
	800-747-5958 / www.novell.com	
*	Oracle Corp.	NE16-NE17
	800-633-0518 / www.oracle.com	
867	Performance Technology	NE56
	800-784-4638 / www.perftech.com	
928	Perle Systems	NE46
	800-60-PERLE	
853	Persoft	NE22
	800-EMULATE / www.persoft.com	
929	Proteon Inc.	NE49
	800-545-7464	
884	QMS	NE27
	800-762-8894 / www.qms.com	
923	RAD Data Communications	NE35
854	Russell Information Sciences	NE5
	714-362-4000	
*	Standard Microsystems Corporation	NE52
	800-SMC-4-YOU	
920	US Robotics Inc.	36
	800-USR-CORP / www.usr.com	
856	US Robotics Inc.	NE7
	800-USR-CORP www.usr.com	
864	Wollongong Group	NE38-NE39
	800-872-8649 www.twf.com	
*	WRQ	NE31
	800-926-3896 / www.wrq.com	

* No Reader Service #. Please Call Advertiser For Information.

For Network Edition information, use Reader Service Card located in the back of the book.

Where the powerful get plugged in.

There's only one real power source for networking product coverage: *PC Magazine* and *PC Magazine Network Edition*.

No one else has more pages, covers more products, publishes more comparative product reviews. Nobody.

In fact, each year we deliver more in-depth product comparisons than the rest of the networking magazines combined.

It's no wonder. Our editorial staff includes leading industry lights like Frank Derfler and David Greenfield. And our testing labs are unparalleled.

All this means we're uniquely qualified to evaluate the nuances of extremely sophisticated networking technology. Last year, we led the

way with the industry's first significant coverage of computer telephony. This year, look to us for incisive reviews of ATM and SQL database products. Plus spotlights and comparisons on distributed management, virtual networking, and IPng.

Of course, when you have unmatched editorial, something else happens. You attract an audience that can't be matched anywhere else, either.

That's why more network buyers and more network resellers rely on us than any other publication.

So if you want to raise your network to a higher power, we have a simple suggestion. Get plugged into the power source: *PC Magazine* and *PC Magazine Network Edition*.



REOT



©1995 Ziff Davis
If you are already
a PC Magazine
subscriber you may
be eligible to receive
the Network Edition
at no additional
charge. Call us at
1-800-289-6429.
Subscribers
please mention
Priority Code A1000.

Finance
Wants It
Affordable.



It all adds up: more features in the 17" Magnavox CM4018 (16.22" viewable image size) color monitor mean more for your money. Like autoscan capability, precise on-screen display, and energy-saving built-in power management. Now and for years to come. Because lasting value isn't an add-on; it's built in.

Engineering
Wants It
Exact.



Total accuracy. The on-screen display feature allows precise digital control of image parameters. Maximum resolution of 1280 x 1024 and 0.28mm dot pitch provide a sharp, flicker-free display. Inside and out, Magnavox has precisely what you're looking for.

No One Puts More

Sales & Marketing Wants Performance.



For a clear picture of what's going on, Magnavox offers colorful, high resolution graphics with refresh rates over 100 Hz.

Whether you're analyzing sales on a spreadsheet, writing a marketing plan or creating detailed graphs, everything's crisp and easy to read.

In A Monitor.

13 years - parts; 1 year - labor.

©1995 Philips Consumer Electronics Company.
A Division of Philips Electronics North American Corporation.
CIRCLE 015 ON READER SERVICE CARD

Get What You Want With Magnavox.

For all those who say you can't have everything, we say nonsense. Magnavox monitors offer a full range of smart features. In screen sizes of 14, 15, 17, 20 and 21 inches (12.86", 14.33", 16.22", 19.5" and 19.96" viewable image sizes respectively) - there's one available to meet your needs. Each crafted for outstanding reliability from one of the world's largest monitor manufacturers. And backed by a 3-year warranty¹. When you see what we've put into them, Magnavox monitors are a very smart buy. To get what you've always wanted, visit your retailer or call 1-800-835-3506.



MAGNAVOX

Smart. Very smart.

THEY NOT ONLY
SOUND GREAT,
THEY PUT PRODUCTIVITY
IN MOTION.



**100 MHz
Now Available**

TravelMate™ 4000M Series

- 486 processors from 50MHz to 100MHz
- Active Matrix Color or Dual Scan Color Displays
- Hard Disk Drives: 200MB to 524MB*
- Built-in 16-bit sound
- PCMCIA Type III Slot
- Integrated Pointing Device
- Multiple Interfaces including SCSI II, Audio Controls, and MIDI/Game port
- Intel Indeo™ Video

Portable CD-ROM Docking System

- Double-speed CD-ROM drive (250ms)
- Built-in stereo speakers
- Separate NiMH battery gives you AC or battery-powered operation
- SCSI II connection
- Optional SCSI II bay for additional hard drive

The right multimedia notebook can give you a decided advantage in your work. That's why we made the TravelMate M Series notebook computers.

These powerful multimedia machines give you desktop PC capabilities in a portable package, including the industry's first truly portable, battery-powered CD-ROM Docking System. So you have the freedom to use them anytime, anywhere.

The M Series continue the TravelMates' award-winning reputation for incredible power, performance and reliability. Each comes standard with 16-bit sound, a built-in speaker and microphone, plus a choice of 486 processors to handle full-motion video and speed you through other multimedia applications.

And the optional, battery-powered CD-ROM Docking System gives you access to the growing libraries of CD-ROM software, no matter where you are.

The TI TravelMates. They're for people who are going places.

For more information or the name of the dealer nearest you, call **1-800-TI-TEXAS** (1-800-848-3927).

EXTENDING YOUR REACH™

 **TEXAS
INSTRUMENTS**



August 1994
TM4000M/25



July 1994

*Depending on model. TravelMate and "Extending Your Reach" are trademarks of Texas Instruments. Indeo is a trademark and the Intel Inside logo is a registered trademark of Intel Corporation. ©1994 TI.
CIRCLE 304 ON READER SERVICE CARD

Your Portable

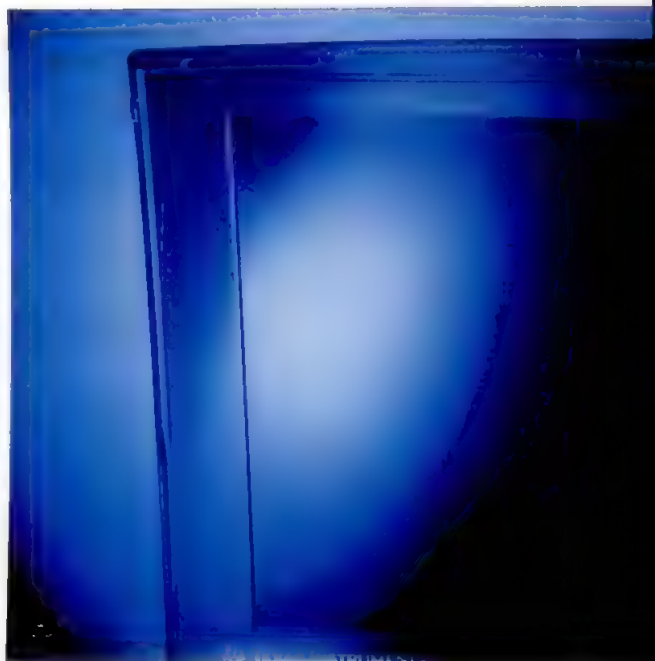
Seriously now: Did you suspect two years ago that your next portable computer would have a 75- or 90-MHz Pentium processor? A 1-gigabyte hard disk? An 11-inch Super VGA display?

All that technology is here now or will arrive in the next few months. It puts the very best portables on nearly equal footing with the premier desktops available in the past six months. For an expanding number of users, the new level of power means this: The portable computer can be the only computer you need. You've heard that refrain before, and you're likely to hear it again in the future.

There are significant costs to maintaining both desktop and portable PCs, including time spent (read *wasted*) linking the systems and synchronizing files. We're in agreement—up to a point—with the consulting-group studies that show how very little more it costs to use a portable rather than a desktop PC, to say nothing of desktop-plus-laptop costs. The hidden cost of laptop lifetime ownership is that the lifetime isn't very long; laptops are dropped, mislaid, or stolen far more frequently than desktops. When is the last time your company had to replace a dropped or stolen ProLinea, Vectra, or Dimension?

MULTIMEDIA NOTEBOOK

Ideal for portable presenters, the multimedia notebook is defined by its built-in (often removable) CD-ROM drive. The best units offer wavetable sound, DX4/100 or Pentium CPUs, 16MB or more of RAM, and active-matrix or Super VGA screens. Typical weight: 7 to 9 pounds. Typical price: \$3,000 to \$8,000.



FULL-FEATURED NOTEBOOK

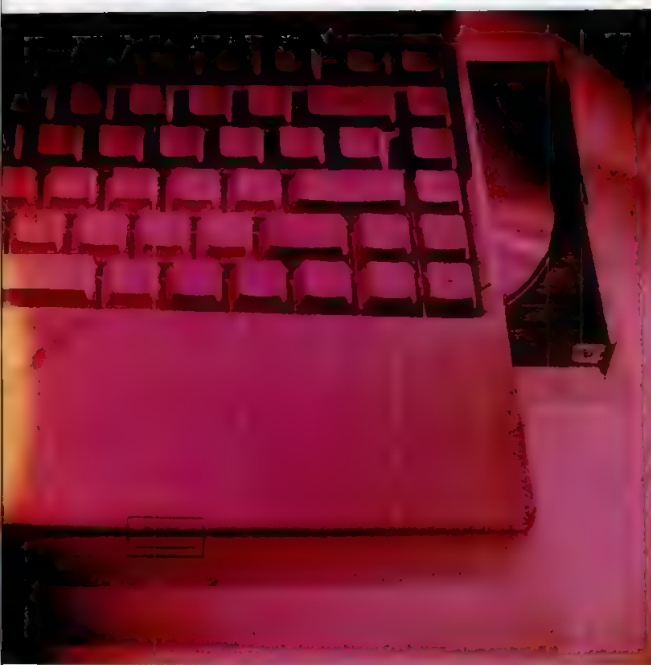
The full-featured notebook strives to replace a desktop system, offering nearly every feature except a built-in CD-ROM drive. Look for a Pentium processor, active-matrix LCD, large hard disk, and built-in fax modem. Typical weight: 6 to 8 pounds. Typical price: \$4,000 to \$7,000.



By Bill Howard

Persona

PC Labs tests 80 color notebooks to find the perfect choice in the category you need.



VALUE NOTEBOOK

Not necessarily the cheapest portable around, the value notebook emphasizes price/performance and uses established technology such as a dual-scan screen and a DX4 processor. Typical weight: 6 to 7 pounds. Typical price: \$2,000 to \$4,000.

SUBNOTEBOOK

Don't be fooled into thinking that "sub" implies low-end. With no built-in floppy disk drive, the subnotebook strives to minimize weight and bulk while maximizing features, performance, and battery life. Typical weight: 4 to 5 pounds. Typical price: \$2,000 to \$5,000.

IN THIS REVIEW

Altima Systems Inc.	117
AMS Inc.	121
ARM Computer Inc.	125
Aspen Computer Inc.	125
AST Research Inc.	149
Astro Research Inc.	149
AT&T Global Information Solutions	153
Austin Direct	153
Broadax Systems Inc.	154
Canon Computer Systems Inc.	154
CTX International	156
Dell Computer Corp.	156
DFI Inc.	160
Digital Equipment Corp.	160
Epson America Inc.	167
Ergo Computing Inc.	182
Everex Systems Inc.	182
FutureTech Systems Inc.	182
Gateway 2000 Inc.	184
Hewlett-Packard Co.	186
HyperData Technology Corp.	186
IBM Personal Computer Co.	186
Maximus Computers Inc.	188
MaxTech Corp.	190
Micro Express	190
MidWest Micro	190
MPC Technologies Inc.	197
NEC Technologies Inc.	197
Novacor Inc.	199
Panasonic Personal Computer Co.	199
Sager Modern Computer Inc.	202
Samsung Electronics America Inc.	202
Sceptre Technologies Inc.	204
Sharp Electronics Corp.	204
Texas Instruments	206
Toshiba America Information Systems	206
Twinhead Corp.	207
Unisys Corp.	207
Wedge Technology Inc.	210
WinBook Computer Corp.	212
Zenith Data Systems	212
ZEOS	213

REVIEW CRITERIA

In this issue, we review 80 of the newest portable PCs. To be included, products had to be battery-powered portable computers with color displays and 486DX2/50 or faster CPUs. They also had to have shipped as of late spring. We didn't set a weight limit, although all came in with a travel weight of less than 10 pounds (this includes the system unit, battery, and transformer, but not the floppy disk drive).

We believe portable PCs fall into four categories, and we sought systems that reflected those four categories, or uses:

- **Multimedia notebooks.** These are systems for traveling presenters and others who just can't live without CD-ROM drives. PC Magazine Labs evaluated them primarily on the basis of their suitability for portable presentations; cost was not the primary issue. Systems had to have 486DX2 or faster CPUs, 16MB (or more) of RAM, internal CD-ROM drives, and built-in audio. The floppy disk drive could be internal, external, or swappable with the CD-ROM drive. If you're going this route, we recommend you buy the fastest CPU, biggest hard disk, and biggest active-matrix color display. Be prepared to lay down between \$3,000 and \$8,000 for the privilege. Here, eleven of the 80 units were multimedia systems.

RECENT REVIEWS

- ▶ **Tapping the Promise of the Pentium**
May 30, 1995page 102
100 Pentium and Nx586 desktop PCs.
- ▶ **Multimedia Marvels**
April 25, 1995page 189
7 portables with CD-ROM capacity and sound.
- ▶ **Power to Go**
January 24, 1995page 108
68 color notebooks.

- **Full-featured notebooks.** These are multimedia notebooks without the multimedia. We set the same CPU and memory configurations, required an active-matrix display and internal floppy disk drive (it could be removable), and made the integrated audio optional (although virtually all serious notebooks have audio today). As with multimedia systems, cost is not the primary concern; we evaluated with an eye toward maximum performance and features. The best-known full-featured systems sell for \$5,000-plus, such as IBM's ThinkPad 755CX and Toshiba's T4900CT. Our review netted 30 systems but caught two of the top five vendors—Compaq and Toshiba—between revisions

of their full-featured lines.

- **Value notebooks.** These are the systems where you weigh price against features and performance. We required a 486DX2 or faster CPU, a color screen of any type, an integrated floppy disk drive, and 8MB (or more) of memory. These units typically sell for \$2,000 to \$4,000. Some of the best-known names are the Toshiba Satellite series and Texas Instruments' TI TravelMate 4000M series. We found 33 value systems, some of which could be considered full-featured notebooks (a vendor with a single offering with 16MB of RAM and an active-matrix display could opt to be in either the full-featured or the value category). All except AST Research's Ascentia 910N, which had a lithium ion battery, used nickel hydride batteries.

- **Subnotebooks.** These are small notebook computers with the floppy disk drive removed. We required a 486DX2 or faster CPU, 8MB or more of RAM, and a color screen. We requested that the systems have travel weights of less than 5 pounds, but we allowed some leeway. We omitted the floppy disk drive from the travel weight (and we measured it that way for our chart "Battery Life vs. Portability") since you can leave it behind, and we believe an increasing number of users are doing just that.

HIGHLIGHTS

Color Notebooks

The spectrum of choice in today's notebook market has widened to the point that there is now a portable for everyone. To this end, we see the market segmenting into four categories: multimedia units with built-in CD-ROM drives for the traveling presenter, full-featured systems for power users looking for a desktop replacement, value notebooks that balance features and performance with an eye toward price, and subnotebooks for those who need light weight and a long battery life.

PENTIUM PORTABLES have arrived in full force, complete with secondary processor cache, EDO DRAM, and PCI expansion buses. We

saw 21 systems with 75- and 90-MHz Pentiums on board, and even one system with a 100-MHz Pentium. Beware these early 90- and 100-MHz Pentium implementations, however: They are standard 3.3-volt, desktop-style processors, not notebook-specific, 2.9-volt parts that reduce battery consumption.

CD-ROM DRIVE—equipped systems are also hitting the mainstream, offering a range of features—from this category's standard-bearer, IBM's ThinkPad 755CD, which offers dual infrared ports and jacks for NTSC-standard video, to more cost-conscious portables such as Broadax Systems' \$2,580 NP9549D.

LITHIUM ION BATTERIES—which effectively add about an hour of life over nickel hydride battery packs—are also cropping up in more and more notebooks. In this roundup, we saw six systems with lithium ion batteries. Expect to see many more vendors switching to this technology in the near future.

SUBNOTEBOOKS are now coming equipped with many of the components you would expect to find in full-featured portables, including integrated modems, 16-bit sound, and IR transceivers. But you will still encounter compromises, whether in reduced keyboard size, inadequate performance, or limited battery life.

Full-featured notebook:

TI TravelMate 5000
75MHz Pentium TFT

Value notebook:

Micro Express NP92DX4

Multimedia notebook:

IBM ThinkPad 755CD

Subnotebook:

Gateway Liberty DX4/100 Best Buy

There's no shortage of innovation among the 80 notebooks that we tested for this roundup. But the machines that earn Editors' Choices do more than showcase new technology: They set new standards for performance, features, and value.

Among the 30 full-featured notebooks in this roundup, we were particularly impressed by the TI TravelMate 5000 75MHz Pentium TFT. For \$6,449, the TravelMate offers a Pentium/75 CPU with 256K of L2 cache and a PCI implementation that's so thorough you can even plug PCI expansion cards into the unit's optional docking station. The 5000's test performance was strong (though not exceptional), and its WinDrain time of just over 4 hours was unmatched by any notebook here.

The standout value notebook is the Micro Express NP92DX4, a price/performance leader in its category. For \$2,495 the NP92DX4 offers a DX4/100 CPU, 128K of L2 cache, 16MB of RAM, a 527MB hard disk, and an integrated 14.4-Kbps fax modem. Battery life was adequate.

If you demand a CD-ROM-equipped notebook, you won't find a machine here that can beat the IBM ThinkPad 755CD. In addition to its double-speed CD-ROM drive and 16-bit wavetable sound, the \$6,964 755CD includes a gorgeous 10.4-inch screen, a DX4/100 CPU, 16MB of RAM, a built-in 14.4-Kbps fax modem run by IBM's Mwave digital signal processor (DSP), and an infrared port.

Subnotebooks present the most significant challenges to notebook designers, and we found only one product that truly met our expectations: the Gateway Liberty DX4/100. This \$4,499 subnotebook managed to pack stellar performance into a package with a travel weight of 5.4 pounds that includes a 10.4-inch dual-scan color screen, a DX4/100 CPU, 24MB of RAM, a 683MB hard disk, and a 14.4-Kbps PC Card fax modem. Amazingly, battery life was over 2 and a half hours and topped 3 hours when we tried Gateway's just-released lithium ion batteries.

HONORABLE MENTION

Dell Computer Corp.'s \$4,897 Latitude 475C, successor to a past Editors' Choice winner, remains one of the best value-line notebooks. It is joined by MidWest Micro's \$3,599 SoundBook II and WinBook Computer Corp.'s \$3,199 XP DX4-100 16/520 Dual Scan Color, all of which earn honorable mentions.



Honorable mentions also go to AST Research's \$5,498 Ascentia 950N, one of the first notebooks with an active-matrix Super VGA screen, and to the IBM ThinkPad 755CX, a \$7,164 Pentium-powered notebook that succeeds the DX4/100-based ThinkPad 755CE. We also liked Toshiba's Satellite Pro 2150CDT, at \$5,098 the closest thing there is to a value-priced yet still fully configured multimedia notebook.

We didn't see a subnotebook that merited an honorable mention. We had particularly mixed feelings about IBM's technically impressive ThinkPad 701C: We loved the "butterfly" keyboard and small form factor, but its mediocre performance and abysmally short battery life were disappointing.

TRENDS: IBM, TOSHIBA, TAIWAN INC.

The most significant change we've seen in the past year is that the range between best and worst has narrowed significantly. The fit and finish of products coming from many manufacturing facilities in Taiwan is superb. AST, AT&T, Compaq, Dell, Hewlett-Packard, NEC, and reportedly IBM use or soon will use Taiwanese partners for the assembly of at

least some models. Taiwan has become more competitive at the same time as the soaring yen has made assembly in Japan a costly proposition.

A second shift—although it could be temporary—is that in terms of absolute technical leadership, the notebook market is down to a two-horse race: IBM and Toshiba. Compaq stumbled badly in the past year and has slipped from first to (by

some accounts) fourth in U.S. sales, while Apple's PowerBook line lacks the trendiness it had two years ago.

For sheer technical innovation, IBM's U.S. and Japan research facilities are unparalleled: Consider the TrackPoint pointing stick, the folding (sliding) TrackWrite "butterfly" keyboard, and the LCD screen on the ThinkPad 755CV (reviewed in First Looks, July 1995) that converts to an overhead projection panel. But Toshiba has been quicker to market with Pentium PCs and lithium ion battery technology; in our opinion, it currently has the edge on fit and finish. Texas Instruments has the technical ability to compete and a newfound corporate commitment to portables. Translation: TI may finally shed its rep as a gang of

Our Contributors: BILL HOWARD is an executive editor at *PC Magazine*. CAROL VENEZIA and ANUSH YEGYAZARIAN are staff editors at *PC Magazine*. ROBERT S. ANTHONY is a senior writer and WILLIAM P. FLANAGAN is a staff writer at *PC Magazine*. JODI L. WYNBLATT is a senior editorial researcher and MARY E. BEHR and CADE METZ are editorial researchers at *PC Magazine*. MELISSA J. PERENSON is an editorial assistant at *PC Magazine*. MARGARET PIEMONTE is a technical analyst at PC Magazine Labs. JOHN CLYMAN was the associate editor in charge of this story, and RICHARD FISCO was the project leader.

COMPAQ NOTEBOOKS. FROM EXTRA PORTABLE TO EXTRA POWERFUL.

Wherever your work takes you, you can be sure one of these Compaq® notebook PCs makes sense for you. Call and ask us about the Compaq Contura® 400 Series – a powerful combination of affordability and features. Or if you're on the road more often than not, the Contura Aero™ is a great choice. Why? Weighing in at just 4.2 pounds, it's our lightest, smallest notebook. But if you need full-function desktop capabilities, ask us about the Compaq LTE Elite™ with its optional SmartStation™ Expansion Base. This high-performance notebook is at home on the road, and on your desk.

Whichever Compaq notebook you choose, one of our cost-saving Option Paks™ will make it work even harder for you. And since all our notebooks come with a 3-Year Worldwide Warranty,* you can count on Compaq support whether you're working at home, or in one of over 85 countries around the world.



NOTEBOOKS THAT
REALLY TAKE YOU PLACES.

CHOOSE YOUR COMPAQ NOTEBOOK



Contura Aero 4/33C

- 486SX/33MHz Processor
- 4MB RAM
- 250MB Hard Drive
- 7.8" Color Backlit STN VGA Display
- One PCMCIA Type II Slot
- 3.5" External Diskette Drive
- Integrated Compaq EasyPoint™ Trackball
- Enhanced NiMH Battery with 2½ to 4 hours of battery life
- Security and Power Conservation Features
- AC Adapter
- Weighs only 4.2 lbs.
- Preinstalled MS-DOS® 6, MS-Windows® 3.1, Lotus Organizer, and TabWorks®
- WinLink File Transfer Utility with Cable
- 3-Year Worldwide Warranty*

Only \$1,199*



Contura 420C

- 486DX4/75MHz Processor
- 8MB RAM
- 420MB Hard Drive
- 10.4" Color Dual Scan Display
- Two PCMCIA Type II Slots
- 3.5" 1.44MB Diskette Drive
- Integrated Center-Mounted Trackball
- Enhanced NiMH Battery with up to 5½ hours on a single charge
- Tilting, Full-Function Keyboard
- Wall-Mount AC Adapter
- Optional Docking Base
- Weighs only 5.9 lbs.
- 3-Year Worldwide Warranty†

Only \$2,599*

Contura 410C

- 486DX2/50MHz Processor
- 4MB RAM
- 350MB Hard Drive
- 9.5" Color Dual Scan Display

Only \$2,099*



LTE Elite 4/75CX

- 486DX4/75MHz Processor
- 8MB RAM
- 340MB Removable Hard Drive
- 9.5" Color VGA TFT Display
- Built-in AC Adapter
- Two PCMCIA Type II Slots
- 3.5" 1.44MB Diskette Drive
- Built-in Enhanced EasyPoint Trackball
- NiMH Battery with 2½ to 4½ hours of battery life
- 6.93 lbs. total carrying weight
- Preinstalled MS-DOS 6, MS-Windows 3.1, Microsoft® Video for Windows (Runtime), and TabWorks
- 3-Year Worldwide Warranty†
- Price includes a FREE Compaq SmartStation Expansion Base** (shown at left)

Only \$4,299*

Contura Aero Option Paq

- Compaq 192 PCMCIA Fax Modem
- Enhanced NiMH Battery Pack
- Choice of Kensington Traveling Tote Case or Compaq Backpack

Only \$279

Contura Option Paq

- Compaq 192 PCMCIA Fax Modem
- Enhanced NiMH Battery Pack
- Kensington Executive Traveling Case

Only \$339

Elite Smart Option Paq

- Compaq 150 Color Monitor
- Enhanced Keyboard and Mouse
- APC Professional 7 Surge Protector

Only \$499

* Call for lease price. Leasing is provided by GE Capital Services for a term of 36 months and is subject to approved credit and certain terms and conditions. Call for details. Reseller prices may vary. †Restrictions and exclusions apply. Battery packs and certain options are covered by a One Year Warranty. Compaq Contura Aero, Contura 410C, Contura 420C and LTE Elite are covered by a Three-Year Worldwide Limited Warranty. **Free SmartStation Expansion Base promotion is for LTE Elite model 4/75CX only. Free offer valid while supplies last. Offer available in the U.S. only. © 1995 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo are registered U.S. Patent and Trademark Office. Contura is a registered trademark. DirectPlus is a registered service mark. Option Paq is a service mark, and EasyPoint, LTE Elite, SmartStation and Aero are trademarks of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft, MS-DOS and Windows are registered trademarks of Microsoft Corporation. TabWorks is a registered trademark of Xerox Corporation.

COMPAQ
DirectPlus



1-800-888-6127

Monday-Friday 9-5 EST

For the name of your nearest Compaq DirectPlus Service, call 1-800-441-1344

great engineers who couldn't market their way out of a paper bag.

HOT NEW FEATURES

Among these 80 notebooks, one-quarter had Pentium power, primarily the Intel 3.3-volt 75-MHz part, while about half used DX4/100 or DX4/75 CPUs. At the end of May, Intel announced a 2.9-volt 90-MHz Pentium that uses roughly the same power as the 75-MHz part (relative power consumption increases by the square of the voltage), and we expect to see a 2.6-volt 120-MHz Pentium by fall.

The nine reviewed systems with 90-MHz Pentium CPUs used the less desirable 3.3-volt parts. After this summer, we don't think there's any reason to buy a non-Pentium portable computer except as an occasional-use, e-mail machine or note-taker. Intel's mid-June CPU pricing (in quantities of 1,000) was \$427 and \$377 for its 2.9-volt and 3.3-volt 90-MHz Pentiums and \$275 for the 75-MHz Pentium. By comparison, DX4/100 CPUs were \$204 and DX4/75 CPUs were \$133

for the desktop pin-grid-array version and \$112 for the SQFP mobile version. These CPUs cost less than half of what they did a year ago, which effectively means that you won't save much more than \$100 by slipping back to a 486-based system. Four Cyrix-based notebooks are reviewed here. (AMD, whose CPUs were not seen in this review, has said it hopes to drive the cost of the 486 to \$1 per megahertz by year's end, meaning a \$100 486/100.)

In this review, we saw the first five of what will soon be a flood of Super VGA (800-by-600) displays; likewise, we saw seven systems come through with PCI buses for faster video performance. Hard disks of 700MB are now commonly available, and 800MB to 1GB hard disks can be had as upgrades. Note that some vendors advertise drive capacity in millions of bytes. *PC Magazine* continues to measure in megabytes (1,024 bytes squared, or 1,048,576). For a rough conversion, subtract 5 million from every hundred million bytes a vendor reports.

For instance, 720 million bytes is 687 megabytes.

Other features of interest making their way into a substantial number of portables include integrated audio, lithium ion battery technology for longer battery life (on the average, roughly an hour longer than nickel hydride), and infrared ports conforming to the IrDA specification for laptop, desktop, and printer communication. Every unit had an integrated pointing device (a first for a full-scale *PC Magazine* roundup) and one or more PC Card slots.

*After this summer,
there's no reason to buy a
non-Pentium notebook
except as an occasional-
use e-mail machine
or note-taker.*

BETTER NOTEBOOKS COMING

Our review cycle caught a number of key vendors changing products. By fall, we expect new high-end (full-featured) lines from Compaq, IBM, and Toshiba, with new case designs and docking stations. Vendors try to get 18 to 36 months out of a docking station design (so business buyers can standardize on accessories), and that allows for only limited changes to the system unit's case during that time.

We expect the coming higher-end notebooks to shed a quarter-inch of case height, and they could lose as much as a pound of weight. This means that this fall's CD-ROM-equipped notebooks will

NOTEBOOK PCs

Suitability to Task and Service & Reliability

Suitability to Task scores reflect how well a product fares for a particular type of application. These ratings do *not* take price into account. From best to worst, possible ratings are *excellent*, *good*, *fair*, and *poor*.

We publish **Service & Reliability** ratings for vendors that received at least 50 responses in our latest poll of 17,000 subscribers. These results reflect readers' experience with all notebooks that a given vendor manufactures, not just the products reviewed here. For details, see our issue of July 1995.

The **reliability** rating is a measure of respondents' satisfaction with the reliability of machines from the vendor in use over the past two years.

The **repair** rating is a measure of respondents' satisfaction with the repair service provided by the vendor for machines in use over the past two years.

SUITABILITY TO TASK

Product Name

Desktop replacement	Excellent
Road warrior	Poor

The **desktop replacement** rating indicates how well this notebook serves as a substitute for a desktop PC. Factors contributing to this rating include display resolution and size, hard disk capacity, performance, and the availability of a docking station or port replicator.

The **road warrior** rating indicates how well this notebook is suited for prolonged use on the road. Key factors in this category are battery life, travel weight, case dimensions, performance, screen size, keyboard, and the inclusion of an integrated fax modem.

SERVICE & RELIABILITY

Vendor Name

Reliability	Better than average
Repair	Average
Technical support	Average
% needing repair	Worse than average

The **technical support** rating is a measure of respondents' satisfaction with the vendor's technical support for machines in use over the past two years.

The **percent needing repair** rating is a measure of the proportion of machines that respondents indicated needed repair in the first year of use.



Adaptec turns a notebook into a different kind of animal.

Just because you're looking for lightweight notebooks doesn't mean you have any intention of settling for lightweight functionality.

That's where Adaptec comes in. Adaptec's full line of notebook I/O products gives you the desktop-level expandability you're looking for. The power to connect easily to all major SCSI peripherals. The convenience of wireless notebook-to-PC file transfer. Even the ability to upgrade desk-

Adaptec®



IOware®
PRODUCTS

top systems to use the same PCMCIA cards used for notebooks. And, just like all Adaptec IOware® products, Adaptec notebook I/O product are the industry's best in quality, compatibility and ease of use.

For more information about Adaptec's full line of notebook and I/O products call 1-800-804-8886 ext. 2131 today.* We'll show you how to turn the most timid notebook into a real computing animal.



Introducing the AIRport™ 2000 kit, for quick, wireless infrared file transfer and synchronization between notebooks and desktop PCs.



Connect up to 7 SCSI peripheral devices via the parallel printer port with the MiniSCSI™ Plus kit. The MiniSCSI EPP (Enhanced Parallel Port) adapter has all the features of the MiniSCSI Plus with the added benefit of increased performance – resulting in transfer rates of up to 1MB/sec.



Introducing the CardPark™ kit. Compatible with virtually all PCs, now you can use your notebook PCMCIA cards with your desktop system.



For PCMCIA connectivity, the 16-bit SlimSCSI™ kit is your best connection to the fastest portable I/O bus. You'll enjoy data transfer rates of up to 2MB per second. Kit includes detachable 3 foot cable, installation guide and Adaptec EZ-SCSI™ software.

adaptec

I/O. NOW MORE IMPORTANT THAN EVER.

* For information by fax, dial 1-408-945-2570, ext. 2131, request document nos 24540, 24560, 24670 and 24680. ©1995 Adaptec, Inc. All rights reserved. Adaptec, the Adaptec logo, IOware, the IOware logo, AIRport, CardPark, MiniSCSI, and SlimSCSI are trademarks of Adaptec, Inc. which may be registered in some jurisdictions. All other trademarks used belong to their respective owners.

The WinBook's a winner...



February-July 1995
WinBook XP
DX2/50 8/25 Mono



May 1995
WinBook XP
SX33 8/25 Mono



February-April 1995
WinBook XP
DX4/75 8/25
Dual Scan

"...the new top dog..." "WinBook's DX4-100 entry this month is a winner in many respects. For one thing, it's a speed demon that produced great test results, finishing our benchmarks faster than a typical DX4-100

notebook—this makes it one of the fastest notebooks you can buy for under \$3000." PC WORLD, Top 20 PCs, May 1995



PC Laptop
Most Improved Portable
January 1995
WinBook XP

"Is it too good to be true?...the WinBook has gone on to offer a notebook that everyone seems to want. The reason is simple: value....The WinBook XP offers good performance and surprisingly good battery life as well as affordable RAM and hard drive upgrades."

PC LAPTOP, 1994 Editors' Choice Awards, Jan. 1994



August 1994 WinBook XP
DX2/50 4/250 Monochrome

With plenty of processing power, (and) enough battery life to handle a transcontinental flight easily,...the WinBook XP... is a value winner." "...the WinBook is the lightest full-size notebook in the roundup;..." "The WinBook XP posted an unprecedented battery life..., and though its dimensions are those of a regular-size notebook, its weight is closer to that of a subnotebook." PC MAGAZINE, Cover Story: Notebooks, Aug. 1994



Laptop Buyer's Guide
JULY 1995 WINBOOK XP
DX4/100 8/10
Native 800x1000

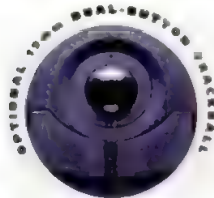
"The combination of price and features make the WinBook XP a good solid machine at many different price levels..." "For the combination of features in this notebook, keeping the pricetag under \$4,000 is a real accomplishment. Applause to the WinBook for a solid machine at a fair market price." LAPTOP BUYER'S GUIDE AND HANDBOOK, Cover Story, July 1995



APRIL 1995 WinBook XP
Best Value: Notebook & Replacement

"As the name says, the WinBook's a winner" "...the WinBook XP is an excellent value." (Awarded BYTE Best for Low Cost Systems and 2nd Runner-Up for Desktop Replacement) BYTE, 30 No-Compromise Notebooks, April 1995

Choose the pointing device that works best for you



WinBook
COMPUTER CORPORATION
a subsidiary of Micro Electronics, Inc.

Call us today, toll-free
1-800-293-1636
Monday-Friday, 8am-9pm EST • Saturday, 9am-4pm

Use your VISA, Discover Card, MasterCard, personal check or P.O. with credit approval.
U.S. sales only. 30-day unconditional money-back guarantee from date of purchase.

Ask about our new 3-year extended warranty package

©1995 WinBook Computer Corporation. All rights reserved. WinBook is a registered trademark of Micro Electronics, Inc. The Intel Inside logo is a trademark of the Intel Corporation. All other trademarks and registered trademarks are property of their respective corporations. All prices and specifications are subject to change without notice or obligation. Prices do not include shipping.

100MHz
\$1999

WinBook XP

TECHNICAL SPECIFICATIONS

- SL-ENHANCED INTEL 486 DX4-75MHZ OR 486DX4-100MHZ
- 5.9 LBS. DUAL-SCAN COLOR OR 6.1 LBS. OPTIONAL ACTIVE MATRIX COLOR
- DIMENSIONS: 11.3" X 8.5" X 1.7"
- 4MB, 8MB OR 16MB RAM (EXPANDABLE UP TO 32MB)
- 3.5" 1.44MB DISKETTE DRIVE
- REMOVABLE 340 TO 810 HDD
- VGA DUAL-SCAN COLOR OR OPTIONAL ACTIVE MATRIX MONOCHROME UNITS ALSO AVAILABLE
- 10-CELL NiMH BATTERY & AC PACK
- SUSPEND/RESUME FEATURE
- TWO TYPE II OR ONE TYPE III PCMCIA SLOT
- INTEGRATED DUAL-BUTTON POINTING STICK, OPTIONAL DUAL-BUTTON 19MM TRACKBALL OR OPTIONAL DUAL-BUTTON TOUCHPAD
- PARALLEL, SERIAL AND PS/2 PORTS
- 1MB VIDEO MEMORY WITH EXTERNAL VGA PORT
- LCD FUNCTION INDICATOR PANEL
- 14.4 SEND/RECEIVE FAX/VOICE/DATA MODEM OPTIONAL
- INTERNAL AUDIO OPTIONAL
- OPTIONAL DOCKING STATION WITH 4X CD-ROM

- \$1999** • Intel 486 DX4-100MHz
• 10.3" dual-scan color display
• 4MB RAM/340MB HDD
- \$3999** • Intel 486 DX4-100MHz
• Active matrix color display
• 16MB RAM/810MB HDD
• 14.4 Fax Modem
• DOS and Windows

\$\$ Comparable savings on all other WinBook XP's—from our base models to notebooks for the power user. For current pricing and configurations, call 1-800-293-1636.

DOCKING STATION
WITH 4X CD-ROM

\$399

Docking Station

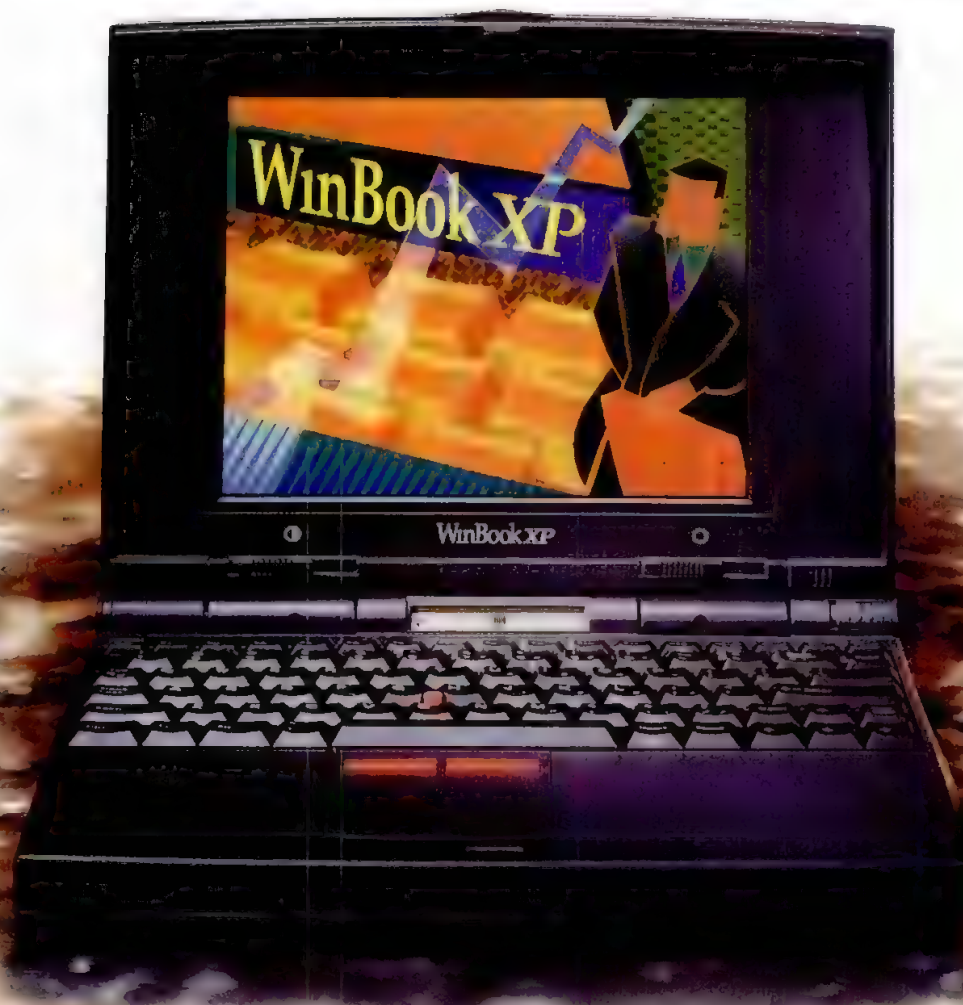
TECHNICAL SPECIFICATIONS

- TRANSFORMS YOUR WINBOOK INSTANTLY TO A FULL-FUNCTION DESKTOP COMPUTER
- INCLUDES QUAD-SPEED CD-ROM DRIVE
- TWO EXPANSION SLOTS AND DRIVE BAYS (ONE EXPANSION SLOT AND DRIVE BAY REMAINING WITH CD-ROM INSTALLED)
- BUILT-IN PARALLEL, SERIAL, PS/2 MOUSE, KEYBOARD AND VGA PORTS.



"...the new top dog..."

PC WORLD—May, 1995



**and the 4X CD-ROM
Docking Station
is leading the
pack at only**

\$399!



CIRCLE 085 ON READER SERVICE CARD

weigh the same as this spring's non-CD notebooks.

By the fourth quarter, 11.3-inch, 800-by-600 pixel Super VGA displays will be available, and while 1,024-by-768 panels will be possible, most vendors will wait for 12.1-inch displays in 1996. By the end of 1996, expect to see 13.8-inch displays. 1,280-by-1,024 laptops, anyone?

By year's end we expect a rapid changeover from double-speed to quad-speed CD-ROM drives (as little as 15-mm thick) on multimedia systems. More systems will adopt lithium ion technology, and many will have charging systems that will allow you to use either lithium ion or nickel hydride batteries. We don't, however, expect to see much adoption of the Duracell-sponsored standard-size batteries. Vendors will struggle to integrate transformers into their units; what was just barely possible with 486 CPUs may be unfeasible for higher-end Pentium systems in the short term.

Some vendors will drop the space- and power-consuming secondary cache as faster EDO (extended data-out) DRAM becomes more readily available. They say there's no performance loss; PC Labs believes there is but that it's minor. We expect to see big performance gains in graphics subsystems. In the past, vendors figured that fast graphics hogged power and would only smear the LCD, so why bother?

Here's what a high-end system might look like at the end of 1995: 120-MHz Pentium CPU, 1.2GB hard disk, built-in quad-speed CD-ROM drive, PCI local-bus graphics with MPEG II-compliant video, 11.3-inch Super VGA display, lithium ion battery, built-in 28.8-Kbps modem, and 32-bit CardBus PC Card (PCMCIA) slots.

While that will be a mindshare product, the market-share products will be the value notebooks. We expect to see a big push to move well-equipped—not stripped—value notebooks into the \$1,750 to \$3,000 price range. Some vendors say they'd like to see value notebooks selling for only \$500 more than comparable desktop PCs. As Korean LCD panel makers ramp up production, you'll see significant downward price pressure on the system component that is most expensive (along with the CPU).

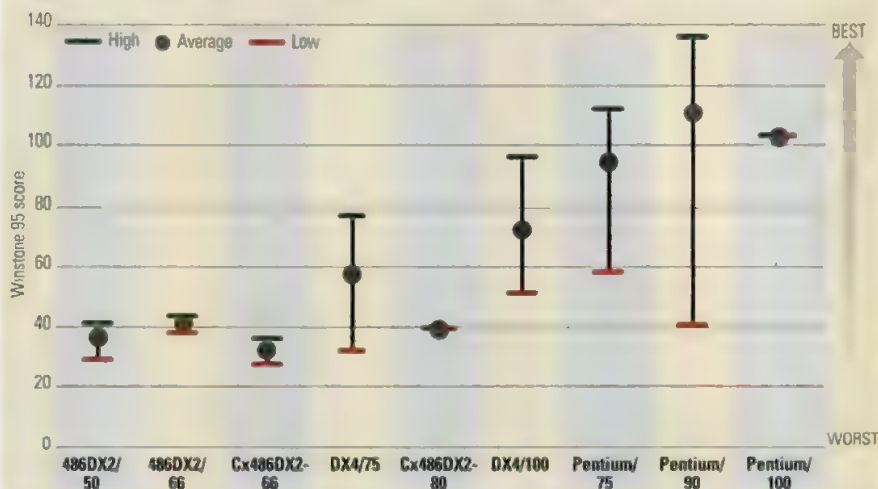
TOO LATE TO REVIEW

Here is a summary of systems that were announced but not shipping as of our deadline: The IBM ThinkPad 755CV (with the screen that can be used on an overhead projector) was previewed in our July issue, and the AMS PowerCD, the Dell Latitude XPi, the Toshiba Portégé

than its modem. Toshiba's just-announced Portégé 610CT is brilliant: a 4.8-pound 90-MHz Pentium system with a 686MB hard disk, a 9.4-inch active-matrix color display, and 8MB of EDO DRAM standard. And HP's ultraslim OmniBook 600C is also due for an upgrade this summer.

Winstone 95 Scores by CPU Type

It's no surprise that the fastest notebooks here used Pentiums, but a Pentium does not guarantee stellar performance: The one Pentium/100 unit, the Maximus PowerMax, was outperformed by most Pentium/90s and a handful of Pentium/75s. Notebooks based on Intel's clock-tripled DX4s easily outpaced those using the company's clock-doubled 486DX2 chips. Machines based on Cyrix's 486DX2s were near the bottom of the pack.



610CT, and a 90-MHz Pentium version of the TI TravelMate 5000 are reviewed in the First Looks section of this issue.

COMEBACK FOR SUBNOTEBOOKS

Subnotebook computers have generated more publicity than sales. Many of the products were not very good (Compaq's Aero) or were not improved beyond the initial offering (NEC Versa S). Users found subnotebooks underpowered or feared being in situations where they needed floppy disk drives and forgot to bring them, and PC managers feared that users would leave clip-ons in hotel rooms.

The vendors who stuck it out may be rewarded. The products now available are substantially better. IBM's ThinkPad 701C is a technical marvel with its folding keyboard, although we were less than impressed with its performance (it uses a slow DX4/75) and battery life (provided by a nickel cadmium battery). It also requires a clunky mini-replicator needed for any I/O connection other

IN THIS ISSUE

Our reviews of 80 notebook computers are arranged alphabetically by vendor name. If a vendor sent multiple notebooks, all the systems are covered in a single review. Many of the elements in our traditional portables reviews return in this story, including "Battery Life vs. Portability" charts, Price/Performance Indexes (bang for the buck), benchmark test results, and features tables. They are all coded to indicate our four notebook categories: multimedia, full-featured, value, and subnotebook. In addition, we rate each notebook for Suitability to Task as a desktop replacement and as a road warrior.

Elsewhere in this issue you will find reviews of 7 portable thermal and ink jet printers, 9 remote-control packages for dialing in and accessing data while on the road, and 11 workgroup contact managers suitable for portables users. We also compiled a special section of phone numbers, tips, and tricks for road warriors.

Ready,

Set,

Go!



ZEOS Meridian Notebooks...



Microsoft® Applications Now Included!

Meridians with unretouched photos of active matrix displays.

Top-Notch Speed Demons.

Vrooom! ZEOS Meridian notebooks are setting the pace—racing through application after application. They're swift and powerful. They're the *indisputable* performance champs.

And they just got faster! Added to our already speedy Meridian line is the ZEOS Meridian 850 notebook featuring a Pentium processor up to 90MHz.

While each Meridian product is distinct, they all have several hot features that add to their impressive speed and ease of use including local bus video; a comfortable palm rest with an 84-key keyboard and an integrated TruePoint pointing device; and now Microsoft® applications software included free!

Meridian 400 Subnotebook



"ZEOS is out to prove that good things do come in small packages with its Meridian 400C subnotebook," reported *Windows Magazine*.

At 3.9 pounds, the Meridian 400 is molded with a special carbon-fiber material that cuts weight and improves durability. And with your choice of a 486DX2-50 or DX4-100 processor, hard drives to 350MB, and RAM that's user upgradable to 20MB, this notebook is "faster than a speeding

desktop," as *Computer Shopper* said.

The 400 features active and dual-scan color screen options. You also get two Type II PCMCIA slots and an external ultra-light 3.5" 1.44MB floppy drive (included in Packages 2 and 3).

Meridian 800 Notebook



"The 800C notebook offers sleek styling, solid construction and hot performance.... one of the fastest notebooks we've ever tested," said *Windows Magazine*.

At 6.3 pounds, the Meridian 800 full-size notebook is light enough to travel anywhere yet it's large enough to use for presentations and everyday computing. And with your choice of a 486DX2-50 or DX4-100 processor, removable hard drives to 528MB, and RAM that's user upgradable to 20MB, this notebook is the raciest thing around.

For your viewing pleasure, the 800 is available with your choice of color displays—a whopping 10.3" dual scan or 9.5" active. You also get two Type II or one Type III PCMCIA slots, and an internal 3.5" 1.44MB floppy drive.

Meridian 850 Pentium® Notebook

Ultimate horsepower that takes the checkered flag! The Meridian 850 gives you supreme Pentium performance in a bundle weighing only 6.8 pounds. It's light enough to race around the world with you yet it's

powerful and fast enough for the most demanding computing.

For turbo power, the Meridian 850 comes with your choice of Pentium-75 or Pentium-90 processor; user upgradable RAM to 32MB, 256K synchronous SRAM cache, and a removable hard drive to 1.3GB. For the best viewing, the 850 is available with your choice of color displays—a mammoth 10.3" SVGA (800 x 600) dual scan or 9.5" VGA active matrix. You also get 16-bit stereo sound through audio jacks (Sound Blaster Pro compatible) for the best in portable multi-media, two Type II or one Type III PCMCIA slots, and an internal 3.5" 1.44MB floppy drive.

Buy With Confidence

No matter which ZEOS notebook you purchase, you'll be getting the best service and support in the business! ZEOS has won seven *PC Magazine* Readers' Choice for Service & Reliability awards. And, ZEOS was the first to provide 24-hour toll-free technical support.

The ZEOS Meridian will support you as you face the daily rat race. It'll organize each event, tally the results, and even report back to the office—lap by lap. What a way to work—whether you're in the office or speeding around. For a swift notebook that's raring to go 24-hours-a-day, call your ZEOS Systems Consultant today at 800-554-7172.

	Package 1			Package 2			Package 3		
	400C	800C		400C	800C		400C	800C	
486 & DX4	486DX2-50	\$1995	\$2195	486DX2-50	\$2295	\$2395	486DX2-50	CNI \$2595	CNI \$2695
	DX4-100	\$2395	\$2595	DX4-100	\$2695	\$2795	DX4-100	CNI \$2995	CNI \$3095
Pentium	▶ 4MB RAM ▶ 260MB IDE hard drive ▶ 800: Internal 3.5" 1.44MB floppy drive ▶ MS-DOS 6.2, Windows for Workgroups 3.11 ▶ MS Works			▶ 8MB RAM ▶ 350MB IDE hard drive ▶ 3.5" 1.44MB floppy drive. 400: External, 800: Internal ▶ Custom nylon carrying case ▶ MS-DOS 6.2, Windows for Workgroups 3.11 ▶ MS Works			▶ 8MB RAM ▶ 350MB IDE hard drive (400), 528MB IDE hard drive (800) ▶ 3.5" 1.44MB floppy drive. 400: External, 800: Internal ▶ 14.4 PCMCIA fax/modem ▶ Custom carrying case. 400: Leather, 800: Nylon ▶ Extra battery ▶ MS-DOS 6.2, Windows for Workgroups 3.11 ▶ MS Works		
	Pentium-75	850C	\$3295	Pentium-75	850C	CNI \$3795	Pentium-75	850C	CNI \$4195
	Pentium-90		\$3495	Pentium-90		\$3995	Pentium-90		\$4395
	▶ 8MB RAM, 256K synchronous SRAM cache ▶ 528MB IDE hard drive ▶ Internal 3.5" 1.44MB floppy drive ▶ Integrated 16-bit stereo sound ▶ MS-DOS 6.2, Windows for Workgroups 3.11 ▶ MS Works			▶ 16MB RAM, 256K synchronous SRAM cache ▶ 528MB IDE hard drive ▶ Internal 3.5" 1.44MB floppy drive ▶ Integrated 16-bit stereo sound ▶ Custom nylon carrying case ▶ Extra battery ▶ MS-DOS 6.2, Windows for Workgroups 3.11 ▶ MS Office Pro			▶ 16MB RAM, 256K synchronous SRAM cache ▶ 810MB IDE hard drive ▶ Internal 3.5" 1.44MB floppy drive ▶ Integrated 16-bit stereo sound, external speakers ▶ 14.4 PCMCIA fax/modem ▶ Custom nylon carrying case ▶ Extra battery ▶ MS-DOS 6.2, Windows for Workgroups 3.11 ▶ MS Office Pro		

Prices shown include dual scan color display.

Upgrade to **ACTIVE** color display! Meridian 400 add only \$700. Meridian 800 or 850 add only \$800.

Included With Every ZEOS Meridian:



- ▶ 400 & 800: Intel® 486DX2-50 or DX4-100 processor. 850: Intel® Pentium 75 or 90 processor.
- ▶ RAM expandable to 20MB (850 to 32MB).
- ▶ IDE upgradable HDD. 400: to 350MB, 800: to 528MB, 850: to 1.3GB.

- ▶ Local bus video with 1MB video RAM.
- ▶ PCMCIA slots. 400: 2 Type II,

- 800 & 850: 2 Type II or 1 Type III.
- ▶ Display: Color VGA backlit LCD, up to 256 colors. 400: 640 x 480 7.9" DSTN or active matrix. 800: 640 x 480 10.3" DSTN or 9.5" active matrix. 850: 10.3" **800 x 600** DSTN SVGA or 9.5" 640 x 480 active matrix.
- ▶ Supports an external SVGA color monitor at resolutions up to 1024 x 768.
- ▶ 84-key keyboard with embedded numeric keypad, 12 dedicated function keys and inverted "T" arrow keys. Integrated TruePoint pointing device.
- ▶ Ports: Serial, parallel (850: enhanced EPP & ECP)

external VGA video, external keyboard or PS/2 mouse (800 & 850 both). 400 also with external floppy drive. 850 also with mic-in and stereo speaker-out.

- ▶ Replaceable, rechargeable NiMH battery.
- ▶ Full power management features.
- ▶ AC110-240V to DC adapter.
- ▶ 400C: 7.8" x 10.2" x 1.7"; 3.9 lbs. 800C: 8.9" x 11.7" x 1.9"; 6.3 lbs. 850C: 8.9" x 11.7" x 2.1"; 6.8 lbs.
- ▶ EPA Energy Star compliant.
- ▶ FCC Certified Class B; UL Listed.
- ▶ ZEOS Customer Satisfaction Package.

CNI -We can ship today! Call for details.
Fax Orders: 800-362-1205 or 612-362-1205. Phone Orders: Outside U.S. and Canada: 612-362-1212. Government: 800-245-2449. ZEOS Information Systems, Inc. GSA #GS00K94AGS5176. Purchase Orders, MasterCard, VISA, Am Ex, Discover, COO, Z-Card, & leasing programs.

800-554-7172

**24 Hours a Day
365 Days a Year**

ZEOS

ZEOS[®] Can Ship Today!

Our most popular
packages can be shipped the
day you call.* Guaranteed!

It's true. With our special
Computers Now![®] program, many
of our award-winning and most
popular packages can be shipped
the day you call.

It's As Easy As:

1 Choose the ZEOS system
package you want.

(A sampling of our *Computers
Now!* packages is shown at right.)

2 For same-day shipping,
call ZEOS today at
800-554-7172 before 1 p.m.

Central Time, Monday-Friday.

3 Upon credit approval,
we'll ship your system
the same day you order!

Our Guarantee:

If we accept your order for
immediate shipment and fail to
ship your system under the condi-
tions outlined, we will ship it at
our expense as soon as it is ready.*

Need An Add-On?

We have many accessories and
options for your new Meridian that
can also ship the same day you
order—call for more information!



Meridian™ 400A

486DX2-50 \$2995
DX4-100 \$3395

**Subnotebook
Package #2:**

- 8MB RAM
- 350MB IDE hard drive
- External 3.5" 1.44MB floppy drive
- 7.9" active matrix color VGA display
- Custom nylon carrying case
- MS-DOS 6.2, Windows for Workgroups
- MS Works
- 7.8" to 10.2" x 1.7"; 4.1 lbs.



Meridian™ 800A

486DX2-50 \$3195
DX4-100 \$3595

**Notebook
Package #2:**

- 8MB RAM
- 350MB IDE hard drive
- Internal 3.5" 1.44MB floppy drive
- 9.5" active matrix color VGA display
- Custom nylon carrying case
- MS-DOS 6.2, Windows for Workgroups
- MS Works
- 8.9" to 11.7" x 1.9"; 6.3 lbs.



Meridian™ 850C

Pentium-75 \$3795

**Notebook
Package #2:**

- 16MB RAM, 256K synchronous SRAM cache
- 528MB IDE hard drive
- Internal 3.5" 1.44MB floppy drive
- Integrated 16-bit stereo sound
- 10.3" dual-scan color SVGA display
- Custom nylon carrying case
- Extra battery
- MS-DOS 6.2, Windows for Workgroups
- MS Office Pro
- 8.9" to 11.7" x 2.1"; 6.8 lbs.

For active matrix display, add \$800



Meridian™ 400C

486DX2-50 \$2595
DX4-100 \$2995

**Subnotebook
Package #3:**

- 8MB RAM
- 350MB IDE hard drive
- External 3.5" 1.44MB floppy drive
- 14.4 PCMCIA fax/modem
- 7.9" dual-scan color VGA display
- Custom leather carrying case
- Extra battery
- MS-DOS 6.2, Windows for Workgroups
- MS Works
- 7.8" to 10.2" x 1.7"; 3.9 lbs.

For active matrix display, add \$700



Meridian™ 800C

486DX2-50 \$2695
DX4-100 \$3095

**Notebook
Package #3:**

- 8MB RAM
- 528MB IDE hard drive
- Internal 3.5" 1.44MB floppy drive
- 14.4 PCMCIA fax/modem
- 10.3" dual-scan color VGA display
- Custom nylon carrying case
- Extra battery
- MS-DOS 6.2, Windows for Workgroups
- MS Works
- 8.9" to 11.7" x 1.9"; 6.3 lbs.

For active matrix display, add \$800



Meridian™ 850C

Pentium-75 \$4195

**Notebook
Package #3:**

- 16MB RAM, 256K synchronous SRAM cache
- 810MB IDE hard drive
- Internal 3.5" 1.44MB floppy drive
- Integrated 16-bit stereo sound, external speakers
- 14.4 PCMCIA fax/modem
- 10.3" dual-scan color SVGA display
- Custom nylon carrying case
- Extra battery
- MS-DOS 6.2, Windows for Workgroups
- MS Office Pro
- 8.9" to 11.7" x 2.1"; 6.8 lbs.

For active matrix display, add \$800



Free Microsoft® Software!

All Meridian subnotebooks and notebooks include
MS-DOS 6.2 and Windows for Workgroups 3.11. The Meridian
400 and 800 models now feature Microsoft Works and most
Meridian 850 Pentium notebooks include Office Pro.

800-554-7172
24 Hours a Day • 365 Days a Year

Fax Orders: 800-362-1205 or 612-362-1205. Phone Orders:
Outside U.S. and Canada: 612-362-1212, Government:
800-245-2449, ZEOS Information Systems, Inc. GSA #G500K94AGS5176. Purchase Orders,
MasterCard, VISA, Am Ex, Discover, Z-Card, COD and leasing programs.



*Orders must be for Computers Now! configurations, we've listed just a sampling here. Since we continuously update this list of configurations, please call to confirm your system is on the list. This offer is good only as long as these pre-built systems remain in stock. Other ZEOS systems and custom configurations may take slightly longer—about a week. All orders are subject to credit approval. Monitor upgrades available on all desktop Computers Now! packages. Orders must be received by 1 p.m. Central Time, M-F.

Purchase orders are subject to approval. Business leasing programs available. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. Intel Inside and Pentium Processor Logos are trademarks of Intel Corporation. ZEOS is a registered trademark. Computers Now! is a registered servicemark. Z-Card is a servicemark. Meridian is a trademark of Micron Electronics, Inc. ©1995 MIEI

ZEOS, 1301 Industrial Blvd., Minneapolis, MN 55413 USA. Micron Electronics, Inc. is a publicly traded company (NASDAQ symbol: MIEI).

M.E.R. - PCM - 9508

CIRCLE 151 ON READER SERVICE CARD

Altima Systems Inc.

Virage II 486DX4/100 Virage II 486DX2/50

The full-featured \$3,835 Virage II 486DX4/100 and the value \$2,298 Virage II 486DX2/50, from Altima Systems, are aimed at users who require easy upgrade options and multimedia features. Unfortunately, both units were below-average performers in their classes.

In addition to a different CPU, the Virage II 486DX4/100 used 16MB of RAM, a 9.4-inch active-color display, and a 737MB hard disk. The Virage II 486DX2/50 came with 8MB of RAM, a dual-scan 9.5-inch LCD, and a 328MB hard disk.

The units are manufactured by Twin-

head Corp. and are similar to Twinhead's Slimnote 5100C and Slimnote 5100T and to the Sharp PC-8900, all of which are reviewed elsewhere in this issue.

Both units offer integrated 16-bit sound, and the systems' CPUs, RAM, hard disks, and LCD panels are all upgradable. Both units' floppy disk drives can also be replaced by a second nickel hydride battery (\$119).

The Virage II 486DX4/100 posted below-average scores for the full-featured class on all of our Windows-

based benchmark tests. The Virage II 486DX2/50 was outgunned by competing units, as this system also garnered below-average scores for the value class.

The Virage II 486DX2/50 posted one of the best battery times overall, at 2 hours 53 minutes, while the Virage II 486DX4/100 came in near the middle of the pack at 1:55.

The \$199 Virage II Mini-Dock, a port replicator, includes all notebook ports



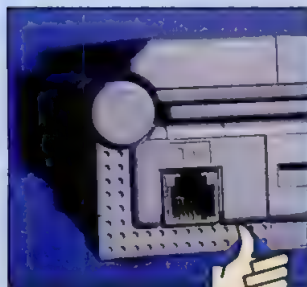
Altima Virage II
486DX4/100.

Picks & Pans



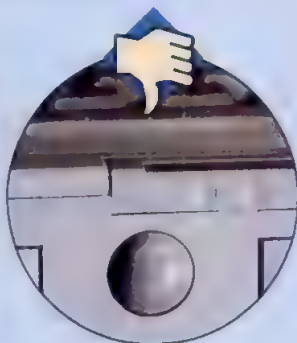
▲ PROJECTOR-READY LCD

Presentations are easy with Wedge's ShowBiz. Just pop the panel off the back of the display and you can use it on an overhead projector.



▲ BUILT-IN MODEM

The WinBook XP DX4-100 32/810 TFT is one of only 13 machines in this roundup with an integrated 14.4-Kbps data/fax modem, a feature we think every notebook should have.



▲ AWKWARD TRACKBALL

We've seen many different notebook-pointing devices, but NEC's Versa P/75's trackball—mounted on the front vertical edge of the case—is especially difficult to use.



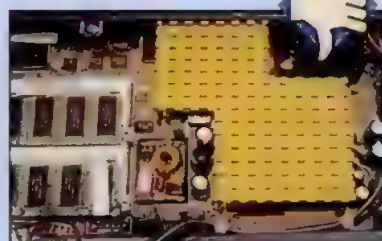
▲ NICKEL CADMIUM BATTERIES

IBM's ThinkPad 701C packs a lot of technical innovation into its small case. But it is also the only system here to use dated nickel cadmium batteries.



▲ "GARAGE-DOOR" PORT COVERS

At the push of a button, the port covers on Texas Instruments' TI TravelMate 5000 75MHz Pentium TFT snap open and disappear inside the notebook—no loose parts to lose or break.

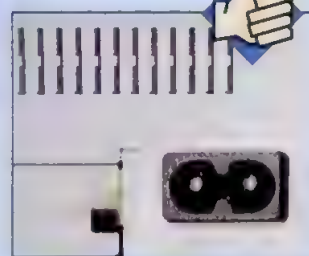


◀ JURY-RIGGED PENTIUM PROCESSOR

Pentium-powered portables are a great idea. But take a look under this hulking heat sink and you'll find a Pentium/100 in a pin-grid package.

▼ INTEGRATED AC ADAPTER

Look Ma, no brick! With Toshiba's Satellite Pro T2150CDT, the AC adapter is built-in, so you not only lighten your load but save briefcase space as well.



I Want Power, Features And Reliability..

You Got It.



Copyright © 1995 Zenith Data Systems Corporation. Zenith Data Systems is a Dell company. Z-NOTE, FLEX, FLEXSHOW, FLEXDOCK and "Make The Connection" are trademarks of Zenith Data Systems Corporation. Central Point Software, Inc. *Figure based on two-battery configuration. Battery life depends on applications used, power management features selected and peripherals attached. **Optional accessories.

I Want It All.

Z-NOTEFLEX.

POWER.....

High-speed processors to 100MHz

Large TFT and passive color LCDs

High-capacity 700+ MB hard drives

Fast local bus video and hard drives

Up to 6.5 hours of battery life*

FEATURES.....

User-upgradable CPU, HDD and LCD

Swappable floppy for second battery

Lockable modular components

Integrated 16-bit audio

Two Type-II PCMCIA slots†

Integrated pointing device with oversized buttons

FLEXDOCK™ enhanced port replicator with networking and expansion capabilities

FLEXSHOW™ multimedia accessory unit with double-speed 5.25" CD-ROM drive

RELIABILITY.....

PC Tools™ anti-virus software loaded

24 hr-7 day toll-free customer support

3-yr limited warranty (first year on site)

If you have a number of needs, look to the computer that offers a number of solutions. Z-NOTEFLEX.™ It's what you want in a notebook.

1-800-945-0673 Ext. 5171

<http://www.zds.com>

ZENITH
DATA SYSTEMS 

Make The Connection™

IntelDX4 is a trademark and the Intel Inside logo is a registered trademark of Intel Corporation. PC Tools is a trademark of PC Tools, Inc. Additional Type-I, Type-II and Type-III PCMCIA slots are available with optional modules. Specifications are subject to change.

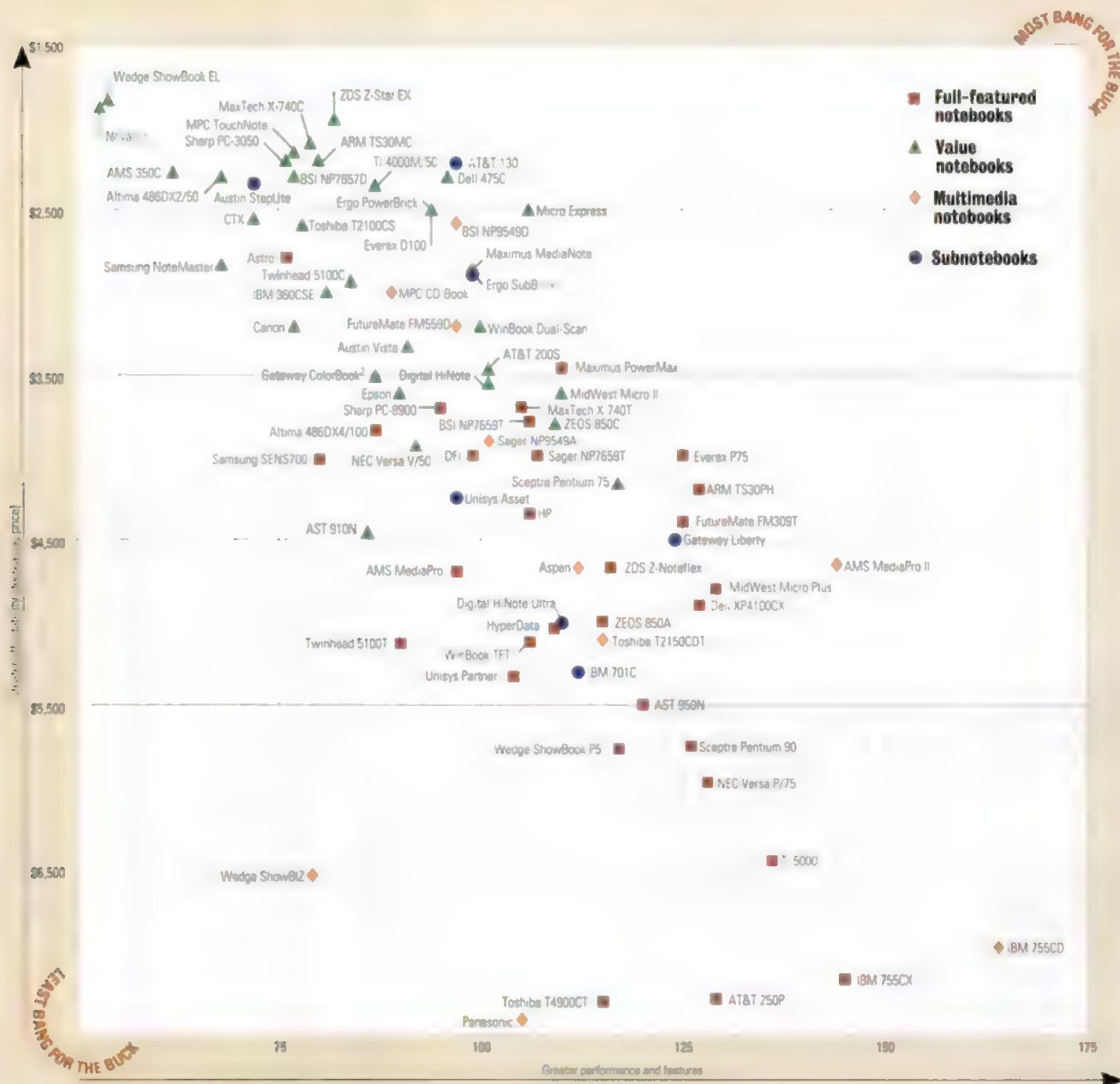
Price/Performance Index

Among value systems, the \$2,495 Micro Express NP92DX4—an Editors' Choice—best combines price with features and performance. It offers 16MB of RAM, a DX4/100 CPU, 128K of L2 cache, a 10.3-inch dual-scan screen, 16-bit sound, and a built-in modem. Dell's \$2,298 Latitude 475C (successor to the 450C, an Editors' Choice from our issue of January 24,

1995) is also attractive. But it lacks the Micro Express unit's built-in sound and modem (though the 475C was sent with a PC Card modem) and has only 8MB of RAM and a 9.5-inch screen.

In the full-featured category, both Everex Systems' \$3,995 StepNote P75 and ARM Computer's \$4,199 ARM-Note TS30PH offer a good mix of price, features, and great performance. The

Everex unit trades a slightly slower CPU and a marginally smaller active-matrix screen for an integrated modem. But the true standout is Texas Instruments' \$6,449 TI TravelMate 5000 75MHz Pentium TFT (an Editors' Choice), which matches those features and adds a PC Card modem, 2MB of DRAM for high-resolution external graphics, and two smart lithium ion hot-swappable batter-



ies that yield a 4-hour-plus battery life.

Multimedia systems have very clear trade-offs. IBM's \$6,964 ThinkPad 755CD, an Editors' Choice, is an average performer, but it's by far the features leader in this class. With its built-in NTSC video and IR ports, 16-bit wavetable sound, integrated modem, brilliant 10.4-inch active-matrix screen, and well-placed CD-ROM drive, no other system on the market can match it. If the 755CD's price puts you off, consider AMS's \$4,645 MediaPro II. This unit has great performance, but it lacks the 755CD's special ports and offers a 9.5-inch active-matrix screen and nickel hydride batteries. Toshiba's \$5,098 Satellite Pro T2150CDT also provides a good balance of features and price and has nearly 3 hours of battery life.

Gateway 2000's \$4,499 Liberty DX4/100 Best Buy subnotebook—an Editors' Choice—packs virtually all the features you would want in a subnotebook. It combines a 5.4-pound travel weight with a nickel hydride battery that lasted 2:35 on our WinDrain test (a lithium ion battery, now standard, pushes the life to over 3 hours). And it came with 24MB of RAM and a 10.4-inch dual-scan LCD. IBM's much-touted ThinkPad 701C offers more technical innovation than the Liberty and includes a 10.4-inch active-matrix screen, a built-in modem, and 16-bit sound, but it isn't close to matching the Liberty's battery life or performance.—
Analysis written by Anush Yegazarian

THE DATA POINTS

Winstone 95 test scores account for 35 percent of each system's performance/features score. WinDrain timings and travel weights account for 6 percent. Warranty terms, technical-support service, and ratings from our Service & Reliability survey make up 11 percent. Features, components, and expandability account for the remaining 48 percent. Price/performance index data is available in the Hardware Library of the Editorial Forum on PC MagNet under 14BANG95.TXT and on the World-Wide Web at <http://www.ziff.com/~pcmag/pclabs/pclabs.htm>.

and adds one Type II and one Type III stacked PC Card slot, an extra serial port, a SCSI port, and a MIDI/game port.

By August, Altima Systems will also be shipping the Virage III CD in 75-, 90-, and 100-MHz Pentium models. These units will feature removable double-speed CD-ROM drives, as well as NTSC video in/out support, lithium ion batteries, and Super VGA displays.

Altima backs its Virage II systems with a one-year warranty. Extended warranties are also available (\$99 for the second year and \$139 for the third year).—
Robert S. Anthony

Altima Systems Inc., Concord, CA; 800-356-9990, 510-356-5600; fax, 510-356-2408.

Circle 451 on reader service card

AMS Inc.

MediaPro TravelPro 350C MediaPro II

AMS hits the right price points with its full-featured MediaPro (\$4,695), its CD-ROM-equipped MediaPro II (\$4,645), and its no-frills TravelPro 350C (\$2,270). But while the MediaPro II was an impressive Windows performer in the multimedia class, the other two AMS entries were somewhat disappointing.

AMS aims the Pentium/90-based MediaPro at power users and targets those who need multimedia features with the DX4/100-based MediaPro II. The 350C, based on a 486DX2/50 CPU, is meant to be a low-cost option for those who don't need built-in audio. The MediaPro II is similar to FutureTech Systems' FutureMate FM559D, also reviewed in this roundup.

The two MediaPro units feature 9.5-inch active-matrix displays that are reversible, so you can turn them around to face your audience in presentations (a feature of dubious value, because you then can't see the screen yourself). The systems also integrate 16-bit audio. The MediaPro has a trackball, while the MediaPro II uses a

pointing stick. All three AMS units came with 772MB hard disks.

The MediaPros each offer two PC Card slots separated by a divider—you can install a Type II and a Type III device at the same time. The bottom slot is shallow, however, leaving most of the PC Card protruding from the case. Each MediaPro also has a standard, built-in fax modem.

The MediaPro II, with a 9.1-pound travel weight, offers some nice conveniences. Though the cutouts for its removable CD-ROM drive and floppy disk drive are different sizes, its battery can be used in either spot. You can also use the CD-ROM drive and floppy disk drive simultaneously—if you use AC power. The MediaPros' dock has three ISA slots, two drive bays, and standard I/O ports.

The 350C, with a travel weight of 8 pounds, is a straightforward notebook with a 9.5-inch dual-scan screen and a trackball in the wrist-rest area. No docking station is available for this unit.

Despite its Pentium/90 CPU, the MediaPro posted below-average scores for its class on all Windows-based tests. The unit had an 8.7-pound travel weight and had a poor WinDrain score of 1:17.

The MediaPro II posted above-average Windows-based test scores, led by the best Winstone 95 score in its category. Battery life was very short, however, at 1:05.

The 350C also posted below-average scores for its value class on all of our Windows-based tests. Its 486DX2/50 CPU is a likely culprit in this DX4-based field. Battery life was good at 1:55.

AMS offers a one-year warranty with these units.—RSA

AMS Inc., Irwindale, CA; 800-886-2671, 818-814-8851; fax, 818-814-0782.

Circle 452 on reader service card

SUITABILITY TO TASK

MediaPro

Desktop replacement	Good
Road warrior	Poor

SUITABILITY TO TASK

TravelPro 350C

Desktop replacement	Poor
Road warrior	Fair

SUITABILITY TO TASK

MediaPro II

Desktop replacement	Excellent
Road warrior	Fair



AMS MediaPro.



A picture is worth But for some reason, Hew

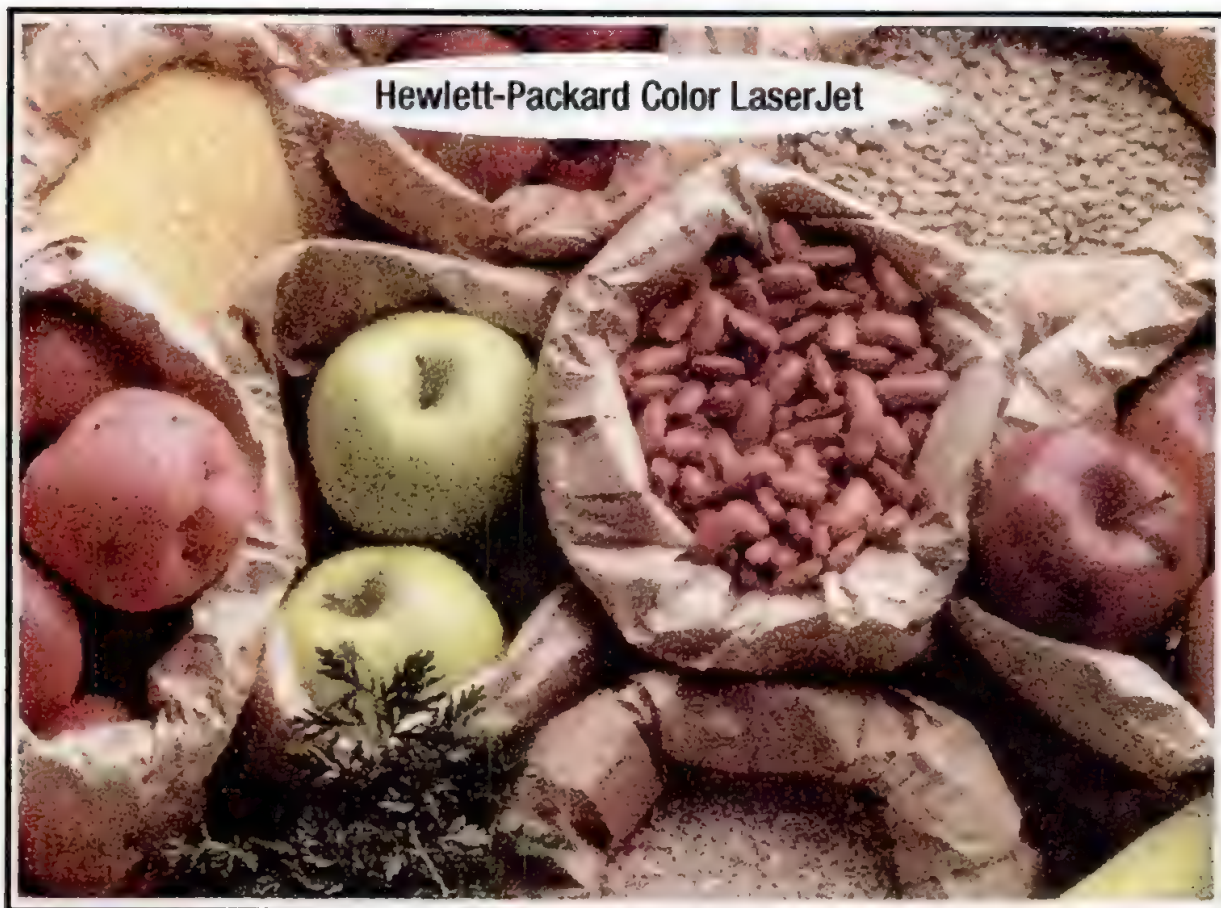
In this case, a picture seems to be worth slightly more than a thousand words. Because after seeing the difference between printers, we just couldn't keep quiet. As you can see above, the Apple® Color LaserWriter® 12/600 PS with Color PhotoGrade delivers near-photographic



quality that can make virtually everything you print more expressive. True 600 dpi resolution means that sharp, black text always comes out as sharp, black text. Your PostScript™ and TrueType® fonts, as well as your

Introducing the Apple Color LaserWriter 12/600 PS

The Apple output shown was printed on the Color LaserWriter 12/600 PS with all printer settings set to default. The Hewlett-Packard output shown was printed on the HP Color LaserJet with the PostScript upgrade and with all printer settings set to default except the halftone setting set to scatter dots (enhanced). may be registered in certain jurisdictions. All Apple products are designed to be accessible to individuals with disability. To learn more (U.S. only), call 800-776-2333 or TDD 800-933-6223.



a thousand words. lett-Packard is speechless.

line art, have never had more impact. And it's incredibly easy to use. Just hit Print. With ColorSync® 2.0, our seamless color-matching



technology, the color you see on your monitor is the color you see on your paper. To hear even more words about the



Apple Color LaserWriter 12/600 PS (words like "surprisingly affordable" and "cross-platform compatibility," to

name just a few), call 800-538-9696, extension 525, for the authorized Apple reseller near you. Or,



if it's more convenient, visit us on the Internet at <http://www.apple.com>. Enough said.



Battery Life vs. Portability

Six machines in this roundup used lithium ion batteries, but none with as much success as Texas Instruments' TI TravelMate 5000 75MHz Pentium TFT, a svelte, full-featured system with a 7.2-pound travel weight. (Travel weight includes the system unit, battery, and transformer, but not the floppy disk drive.) Powered by two hot-swappable, smart lithium ion batteries, it was the

overall battery-life leader in this roundup. This unit's whopping 4-hour-2-minute score on our WinDrain battery test is even more astounding when you consider that this system is based on a Pentium/75 processor and packs a 10.4-inch active-matrix display.

AST's Ascentia 910N, a value notebook, finished second overall, posting a WinDrain score of 3:40. It also used a

lithium ion battery and had an active-matrix display.

Among subnotebooks, Gateway's 5.4-pound Liberty DX4/100 Best Buy had the best battery life, at 2:35. In terms of travel weight, the lightest subnotebook tested was Digital's HiNote Ultra CT475, at 4.8 pounds. But it also posted one of the shortest WinDrain results in this category, at 1:53.



IBM's ThinkPad 701C was the only unit in this roundup to use a nickel cadmium battery. With this relatively under-powered pack, the 701C posted a disappointing 1:40 score on our WinDrain test.

Among value notebooks, the Ascenia 910N was followed by Gateway's 6.6-pound Colorbook² (3:05) and the 7-pound TI TravelMate 4000M/50 Dual Scan Color (2:58).

The most impressive road warrior among the multimedia notebooks we tested was Toshiba's Satellite Pro T2150CDT. This DX4/75-based portable combines the lightest road weight of the group (7.7 pounds) with the longest battery life (2:58).

At the other end of the travel-weight spectrum is the Pentium/75-based Panasonic V41, tipping the scales at 9.6 pounds. But it also had an impressive battery life (2:36) because of its standard dual-battery configuration.

Four of the six lithium ion-powered systems in this roundup were full-featured notebooks. The TI TravelMate 5000 was the best of the group, followed by Dell's Latitude XP4100CX, which lasted nearly 3 hours on our WinDrain test. At 6.9 pounds, it tied for the lightest of the group (with Samsung Electronics' SENS700), making the XP4100CX an ideal full-featured road warrior.

OUR BATTERY LIFE TEST

Our WinDrain battery test measures notebook battery life under a heavy usage scenario, meaning that no system power-conservation features are enabled while the test is running. Under more typical usage patterns, you can expect an additional 50 percent or more of battery life.

Many notebooks have power-conservation features at the chip-set level—and many of these features cannot be turned off. Certain chip sets may monitor processor subsystem activity, keyboard activity (even noting inactivity between keystrokes), or both, and throttle back processor speed when no system activity is detected. These chip-set variations and battery types account for the different results on our test.—*Analysis written by William P. Flanagan*

ARM Computer Inc.

ARMNote TS30PH ARMNote TS30MC

The two units from ARM Computer may look plain, but the \$4,199 full-featured ARMNote TS30PH and the \$2,199 ARMNote TS30MC, a value system, offer impressive feature sets for good prices. But while the TS30PH was also a strong performer, the TS30MC was not.

The Pentium/90-based TS30PH offers a number of useful features for power users, including an infrared transceiver; a 16-million-color, 10.5-inch active-matrix display; a 688MB hard disk; and a reasonable 8-pound travel weight. The TS30MC, with a 7.6-pound travel weight, retains the same case as its sibling but uses a 486DX2/66 processor, a 10.3-inch dual-scan screen, and a 503MB hard disk; it lacks an infrared port.

The TS30PH is similar to four other units: FutureTech Systems' FutureMate FM309T, Midwest Micro's SoundBook Plus, Sceptre Technologies' SoundX Series 3000 Pentium 90, and Wedge Technology's ShowBook P5 (all reviewed elsewhere in this roundup).

Both ARM systems have integrated 16-bit, wave-table-capable audio subsystems as well as built-in microphones, but the TS30PH has two speakers while the TS30MC has one. Both systems offer audio input and output jacks in addition to standard I/O ports and an expansion-bus port, and each uses a small trackball nestled in a large wrist-rest area.

On our Windows-based benchmark tests, the TS30PH was one of the top performers in its class. The unit finished in the top five on all tests.

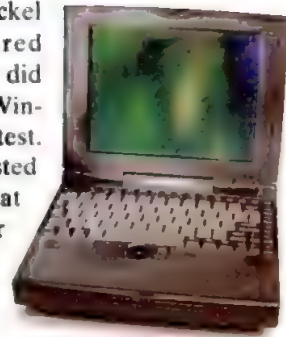
The TS30MC did not stand out in terms of performance. Its Winstone 95 and Graphics WinMark 95 scores were both below average for its class. Thanks mainly to Microsoft Windows for Workgroups, its Disk WinMark 95 score was above average.

Neither nickel hydride-powered ARM system did well on our WinDrain battery test. The TS30PH lasted just 1:49, but that was still longer than the 1:38 logged by the TS30MC.

ARM Computer offers a one-year-parts, three-years-labor warranty for the units.—*RSA*

ARM Computer Inc., San Jose, CA; 800-765-1767, 408-428-9800; fax, 408-428-9528.

Circle 453 on reader service card



ARMNote TS30PH

Aspen Computer Inc.

Universa-CD

The world of multimedia notebooks is relatively new, but the \$4,665 Aspen Universa-CD has all the trappings of a winner—among them, a removable double-speed CD-ROM drive, integrated sound, and an active-matrix screen. The unit is made by Microstar, a Taiwanese company that also builds the multimedia notebooks from Broadax Systems and Sager Midern, reviewed in this roundup.

The Universa-CD's display is crisp, although at 9.5 inches it is slightly smaller than some of its peers' 10.5-inch displays. At a travel weight of 9.4 pounds, the unit is also heavy. Among multimedia notebooks, only the Panasonic V41 weighed more—and the Panasonic unit partially justifies that weight with a 10.5-inch screen and 1 hour more of battery life than the Universa-CD's 1:28 result (using a nickel hydride battery) on our WinDrain test. But keep in mind that the Universa-CD costs about \$3,000 less than the V41.

The DX4/100-based Universa-CD came with 16MB of RAM, 256K of L2 cache, and a 772MB hard disk. Its graphics subsystem is based on the Chips & Technologies 65545 graphics accelerator with 1MB of VRAM. On our benchmark tests, the unit performed extremely well against the other

SUITABILITY TO TASK

ARMNote TS30PH

Desktop replacement	Excellent
Road warrior	Good

SUITABILITY TO TASK

ARMNote TS30MC

Desktop replacement	Fair
Road warrior	Fair

SUITABILITY TO TASK

Universa-CD

Desktop replacement	Excellent
Road warrior	Fair

Now there's absolutely no reason for you to squeeze and squint yourself into a notebook. With the reliable new IBM ThinkPad 701Cs,* you'll find the revolutionary TrackWrite™ full-size keyboard and generous 10.4 inch (measured diagonally) dual scan color screen an absolute winner. This 4.5lb.** heavyweight comes fully equipped. So go ahead, try it on for size.

Once you get your hands on the only notebook PC Magazine† has called the "new standard for others to match," you'll appreciate its full-function speakerphone, answering machine and fax. Not to mention the removable hard drive which gives you a virtually unlimited amount of storage.

"This gem of a tiny computer," as The Wall Street Journal‡ named it, also comes with excellent backup, the IBM HelpWare® line. No matter where you are in the U.S., your questions will be answered by our trained computer experts 24 hours

IBM®



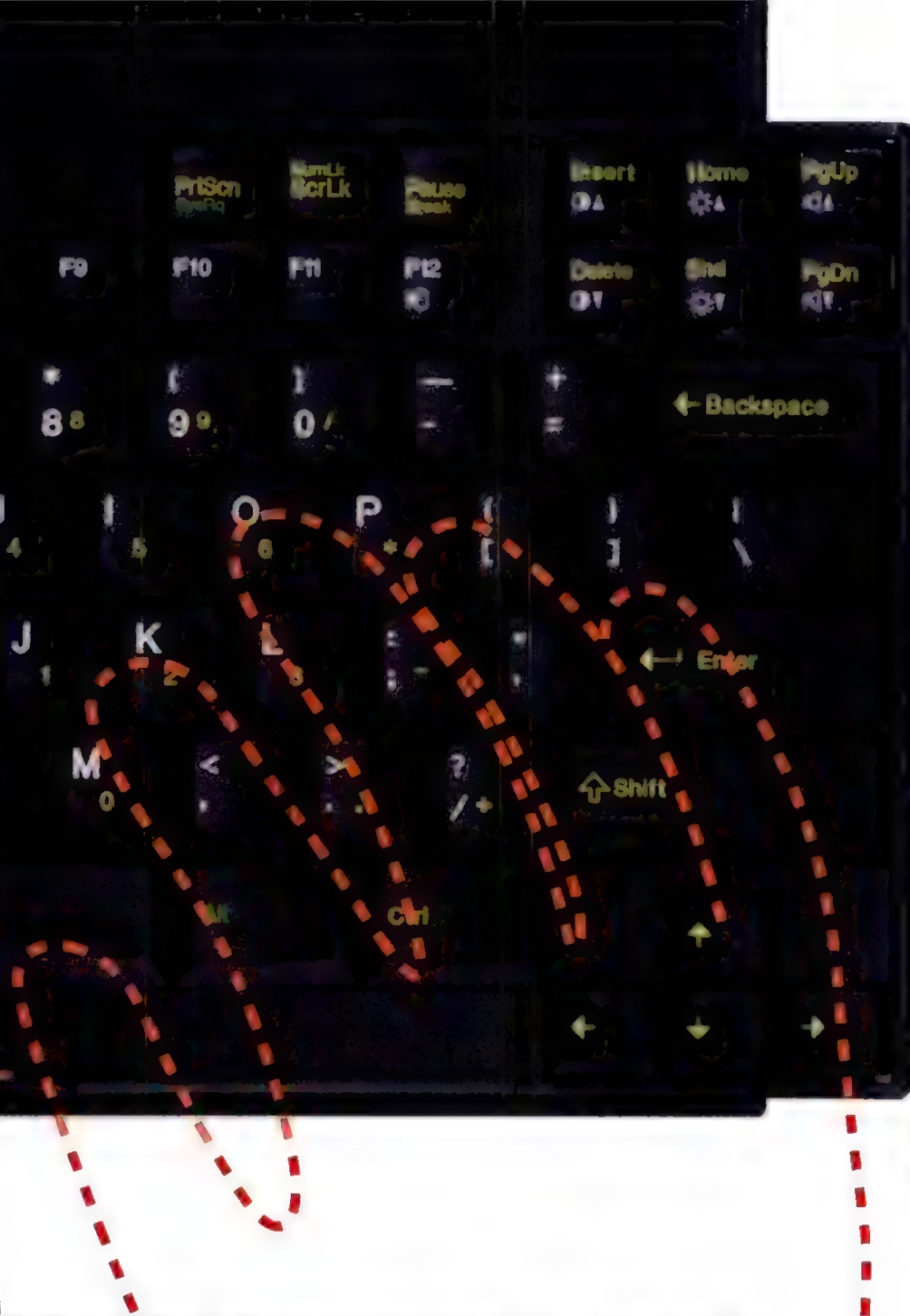
IBM ThinkPad™ 701Cs keyboard shown actual size 11 1/8"

Hands down, no other

ThinkPad 701Cs at a glance

- This 701Cs Notebook includes**
- DX2/50 MHz processor
 - 4MB RAM (up to 20MB)
 - Weighs about 4.5 lbs**
 - 360MB¹ removable hard drive
 - 10.4" (measured diagonally) dual scan color screen
 - TrackWrite™ expanding full-size keyboard with 85 keys and TrackPoint III™ with Quick Stop response and non-slip cap
 - Integrated DSP provides internal 14.4 Kbps data/fax modem, telephone functions with built-in full-duplex speakerphone and digital answering machine
 - Integrated infrared wireless file transfer, synchronization and printing
 - PCMCIA Support for two Type I or Type II cards or one Type III card

IBM PC Direct prices and offerings are subject to availability or withdrawal. Prices/offerings in Canada may vary. Reseller prices vary. Shipping and handling charges are extra. * Assembled in the U.S. ** Weight varies based on variance in components and manufacturing process. Excludes external disk drive. †PC Magazine 3/14/95 ‡The Wall Street Journal 3/2/95 When referring to hard drive, MB equals one million bytes. Accessible capacity varies. ¹Please call 1 800 426-7255 for details on IBM's money-back guarantee and limited warranty. Copies available upon request. ²Upon registration, International Warranty Service is available for those customers traveling to countries where this product is sold and serviced by IBM or IBM Business Partners. ⁴IBM ThinkPad EasyServ is available in the U.S., Canada, and Mexico. ⁵IBM Credit Lease prices are quoted for 36-



notebook measures up.

a day, 7 days a week (excluding some holidays) during the warranty on the toll-free line.

To get a hold of the new IBM ThinkPad 701Cs, just call IBM PC Direct™ today at 1 800 426-7255 and be sure to give them your hand size.

From the compact 9.7" case.



the keyboard expands into a full 11 1/2" wide.



complete with a 10.4" dual scan color screen

Call us. It's that easy.

IBM PC Direct
1-800-426-7255

Enter Source code 4881

• A host of useful software applications Lotus® Organizer™ and SoftNet FaxWorks Voice™ and 13 other applications come preloaded, along with IBM PC DOS 7.0 OS/2™ Warp and Windows™ 3.11.

For HelpWare® service and support

- 3-year limited warranty with International Warranty Service and ThinkPad EasyServ™ courier repair service.
- IBM PC Direct 30-day money-back guarantee.

- Toll-free voice support 24 hours a day 7 days a week excluding some holidays.
- Problem determination, setup and usage assistance for hardware and pre-installed DOS, Windows or OS/2.

Call us, toll-free, Eastern Time
Mon-Fri 9am-5pm, Sat 9am-5pm, Sun 10am-5pm

NOW MORE AFFORDABLE
IBM Credit
Lease \$97 mo.

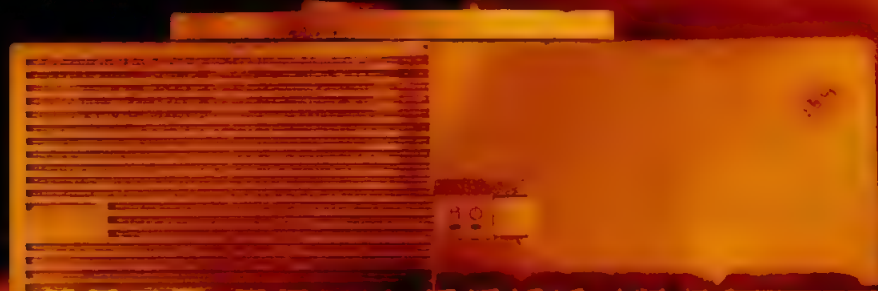
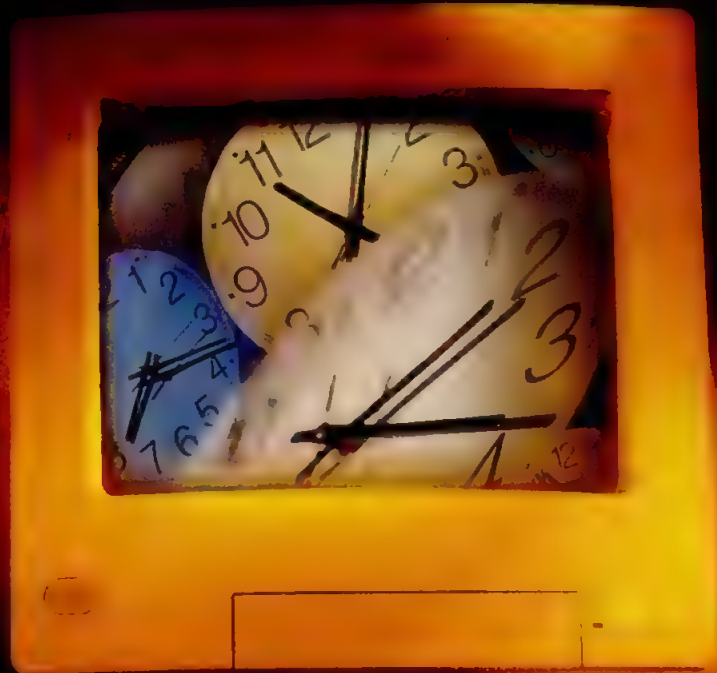


\$2,949

month terms. Lease rates quoted are good through 8/31/95 after which time rates are subject to change without notice. Lease available to qualified commercial customers only. IBM, ThinkPad, OS/2 and HelpWare are registered trademarks and EasyServ, TrackWrite and TrackPoint III are trademarks of International Business Machines Corporation. All other brands and product names are registered trademarks or trademarks of their respective holders. Windows is a trademark of Microsoft Corporation. Third party software programs listed are licensed to customers under non-IBM software vendor's terms and conditions provided with the package. IBM makes no representations or warranties regarding non-IBM software. PC Direct is a trademark of Ziff Communications Company and is used by IBM under license. ©1995 International Business Machines Corporation.

The average person spends 15 weeks, 5 days, 23 hours
and 57 minutes searching for a new computer.*

Take a shortcut.



In this fast-paced, hectic world, who's got time to hunt for a new computer? That's why there's a fast way to find an affordable, yet versatile, workhorse-of-a-computer. A fast way to get it to your door. And a fast way to get responsive service and support.

Call IBM PC Direct.[™] It's that fast. A highly skilled consultant will explain whatever you want to know (and then some) about our IBM PC 300.^{**} Now running on a new, super power-packing Pentium processor that makes all your computing lightning fast. Fabulous features? This high-performance, upgradable PC monitors and tracks itself to prevent potential problems. It wakes itself up day or night, sends or receives faxes, runs applications and faxes you the results.[†] It's preloaded with software that tutors you on diagnostics, automatic scheduling and more.

Built-to-order. If you like, we'll custom configure the PC 300 to your specifications, so you get the computing power you need. No more. No less. From the most basic configuration all the way up to our new, more powerful Pentium[™] processors.

Strong support. Technical problem? No problem. Once we deliver the computer to your door, you'll have

access to HelpWare[®] toll-free voice support, 24 hours a day, 7 days a week, excluding some holidays, during the 3-year limited warranty period.^{††}

For even stronger support, your PC's equipped with Online Housecall, which allows an IBM technician to provide a fast diagnosis via modem.

FedEx Software. Absolutely, positively free. Remember to request your free

FedEx Ship[™] software, preloaded into the PC 300 exclusively by IBM PC Direct.[‡]

What's more, we'll preload Intuit[®] QuickBooks, a highly effective business management

software package. It costs only \$25. That's a \$70 savings.

IBM PC Direct's 30-day money-back guarantee. Okay, your new PC 300 just arrived. If you're not completely satisfied, feel free to return it. No hassles. No questions asked. Give us a call at IBM PC Direct at 1 800 426-7255. Unless, of course, you happen to have 15 weeks, 5 days, 23 hours and 57 minutes to kill.

Call us. It's that easy.

IBM PC Direct

1 • 8 0 0 • 4 2 6 • 7 2 5 5

Enter Source code 4859

The IBM PC 300 SpaceSaver

For more power:

- A Pentium[™] processor chip
- Math coprocessor
- 256KB L2 cache
- Enhanced IDE 540MB[†] HD (upgradable to 1GB HD)
- 8MB RAM (expandable to 128MB)
- PCI local bus
- 64-bit PCI local bus graphics

For expansion needs:

- A SpaceSaver configuration with 3 slots, 3 bays

Pentium 75

\$2255

IBM Credit Lease \$79/month[†]

Pentium 90

\$2657

IBM Credit Lease \$93/month[†]

Optional 14.4 Fax/Modem

Featuring
Wake Up on Ring

\$125



Call us, we're open 8am-10pm Monday-Friday, 9am-5pm Saturday (Eastern Time)

Standard on this IBM PC 300:

- 14V color monitor with a maximum diagonal viewable screen size of 13"
- 1MB video memory
- Upgradable to future Pentium technology or Intel chip
- IBM Basic 101-key keyboard and mouse
- Plug and play enabled
- Energy Star Compliant
- PCMCIA enabled
- DOS, Windows, OS/2[®] Warp and IBM EasyTools
- The HelpWare 3-year warranty includes: 1-year onsite service[‡] 30-day money-back guarantee^{††}



ValueWriter[™] 600

•Exceptional durability

•PC1.5 compatibility, •5ppm output

•600 dpi resolution, •Print Quality

Enhancement Technology (PQET)

• Options in scalable fonts, forms

and logos, 30-day money-back

guarantee. Only \$699

IBM PC Direct prices and offerings are subject to availability or withdrawal. Prices/offerings in Canada may vary. Reseller prices vary. Shipping and handling charges are extra. *STAT Resources, "Buying it in the '90's," September 1992. **Assembled in the U.S. of U.S. and non-U.S. components. †Requires optional modem. ††Please call 1 800 426-7255 for details on IBM's money-back guarantee and limited warranty. Copies of limited warranty available upon request. ‡Requires optional modem and laser printer. 1 IBM Credit Lease prices are quoted for 36-month terms. Lease rates quoted are good through 9/30/95, after which time rates are subject to change without notice. Lease available to qualified commercial customers only. 2 MB = one million bytes, accessible capacity varies. 3 At no additional charge during warranty period. Onsite service for first year of warranty available Monday-Friday 8 am-5pm in your time zone. Second and third year is customer carry-in service. IBM, OS/2 and HelpWare are registered trademarks of International Business Machines Corporation. All other brands and product names are registered trademarks, trademarks or service marks of their respective holders. Windows is a trademark of Microsoft Corporation. Third party software programs listed are licensed to customers under non-IBM software vendor's terms and conditions provided with the package. PC Direct is a trademark of Ziff Communications Company and is used by IBM under license. ©1995 International Business Machines Corporation

Benchmark Tests: Color Notebooks

Desktop power is coming to the road: Pentium processors, L2 cache, bigger hard disks, PCI local buses, new graphics accelerators, and lithium ion batteries are all making notebook computers faster and more capable.

What the Numbers Mean

We divided the 80 notebooks in this roundup into four categories, and we've separated the benchmark test results by category to avoid direct performance comparisons between \$2,500 value-oriented systems and \$7,500 multimedia notebooks. Fifteen systems used DX4/75 chips, and 27 used DX4/100s.

More than a quarter of the machines here are Pentium-powered, primarily by 75-MHz versions of the chip. A few systems we tested used top-of-the-line 90- and 100-MHz Pentium CPUs.

With these fast CPUs comes another performance enhancer: L2 cache. L2 cache has long been considered too power-hungry for portables, but now it's needed to tap the Pentium's performance potential. Nearly all Pentium units we saw included 256K of L2 cache.

WINSTONE 95

On our Winstone 95 tests, which measure overall system performance, the best scores came from systems that combined Pentium CPUs, L2 caches, 16MB of RAM, and PCI buses—much the same combination you'd see in high-performing desktops. On the average, PCI-based systems (found in the full-featured and value classes) turned in higher Winstone 95 scores than notebooks based on VL-Bus or proprietary-bus architectures. We saw only seven PCI-based units, but we expect most manufacturers to move in that direction later this year.

GRAPHICS WINMARK 95

On our Graphics WinMark 95 tests, which measure graphics subsystem performance, we found that machines with C&T 65545 accelerators turned in the best results. The C&T 65545 is a 32-bit chip, so it can't match the speed of 64-bit chips found in fast desktops, but when paired with a fast CPU it still makes for a

speedy graphics solution. Systems based on WD90C24A RocketChips took the second tier, coming in about 30 percent slower, on the average, than those using the C&T chips.

As Super VGA (800-by-600 resolution) screens become more common in laptops, high-performing graphics subsystems will become more important, because a notebook will have to repaint over 50 percent more pixels than on a VGA (640-by-480) display.

DISK WINMARK 95

The most important factor affecting disk-subsystem performance is disk cache. Portables with Windows for Workgroups 3.11 were able to use its 32-bit file-access capability, which is not present under Windows 3.1 or Windows 3.11. The WfWG 32-bit disk cache is more efficient than SmartDrive and provides a big performance boost. In all four categories, the systems loaded with Windows 3.1x consistently scored at the bottom on our

Disk WinMark 95 tests.

As in desktops, hard disks in notebooks are getting bigger and faster. New disks that support Mode 3 and Mode 4 PIO (peripheral I/O) can—in theory—transfer data to and from the system at faster rates (11.1 and 16.6 MBps, respectively) than earlier disks. While Mode 3 can theoretically speed up disk I/O, Mode 4 is limited by the rotational speed of the disk and currently offers no improvement over Mode 3. Neither factors into the equation much when you're running standard business applications (like the ones Winstone uses).

The Western Digital Enhanced IDE specification includes support for Mode 3 and 4 PIO. But E-IDE isn't the only name you'll see. Seagate has its own standards: Fast ATA provides Mode 3 support, and Fast ATA-2 provides Mode 4 support. To confuse matters further, the two dominant suppliers of 2.5-inch notebook-size hard disks are IBM and Toshiba, which support a specification called ATA-2. Bearing little relationship to Seagate's Fast ATA-2, ATA-2 provides support for Mode 3 PIO, although it does not support Mode 4.

CPUMARK₁₆

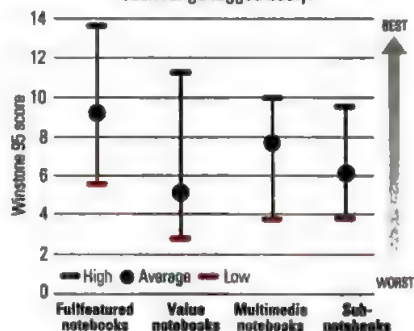
Our CPUmark₁₆ tests measure the performance of the processor and the memory subsystem, which also contains L2 cache and the core-logic chip set. Of portables with L2 cache—which includes most Pentium-based systems—the VLSI Super Core 590 chip set propelled the fastest. It consistently enabled systems to turn in higher CPUmark₁₆ scores than units with Pico Power, ACC Micro Electronics, or Silicon Integrated Systems Corp. chip sets.

Pentium/90-based notebooks consistently led on our CPUmark₁₆ tests; they even beat out the sole 100-MHz Pentium unit, the Maximus PowerMax. The PowerMax used no L2 cache, so its processor/memory subsystem behaved at about the level we'd expect from a Pentium/75. This goes to show that a fast CPU can be poorly implemented.

Toshiba also opted to leave L2 cache off its Satellite T4900CT and Satellite T2100CS, using instead EDO (extended

Winstone 95 Scores by Notebook Category

Full-featured notebooks, many of them with Pentium processors, led the pack in performance; they generally outpaced CD-ROM-equipped machines intended for portable presentations. The best subnotebooks and value notebooks turned in competitive results, but products at the low end of each range lagged badly.



data-out) DRAM, which allows marginally faster memory accesses than typical fast-page mode DRAM. Unfortunately, using EDO DRAM doesn't compensate for the lack of L2 cache: The Satellite T4900CT was the only Pentium/75 machine without L2 cache, and it showed in a dead-last CPUmark₁₆ score among those systems. The Satellite T2100CS, with a 486DX2/50 CPU, fared better; as none of the nine 486DX2/50-based systems used L2 cache, it managed a third-place CPUmark₁₆ score among units with the same CPU.

The WD7855LV chip set caused an interesting anomaly with the two entries from Dell. The Dell Latitude XP4100CX, a full-featured notebook with a DX4/100 CPU, actually scored lower on the CPUmark₁₆ tests than its sibling, the value-class Dell Latitude 475C that uses a slower DX4/75 CPU. After working with Dell engineers, we determined that the WD chip set was being overzealous in its power conservation, throttling down the DX4/100 CPU to a lower speed when the CPUmark₁₆ tests were running. It appears the WD chip set sometimes guesses incorrectly that the CPU is idle. All chip sets in portable PCs try to conserve power by slowing down the CPU speed; some let you turn this feature on or off in the system BIOS, while others (such as the Latitude XP4100CX) do not.

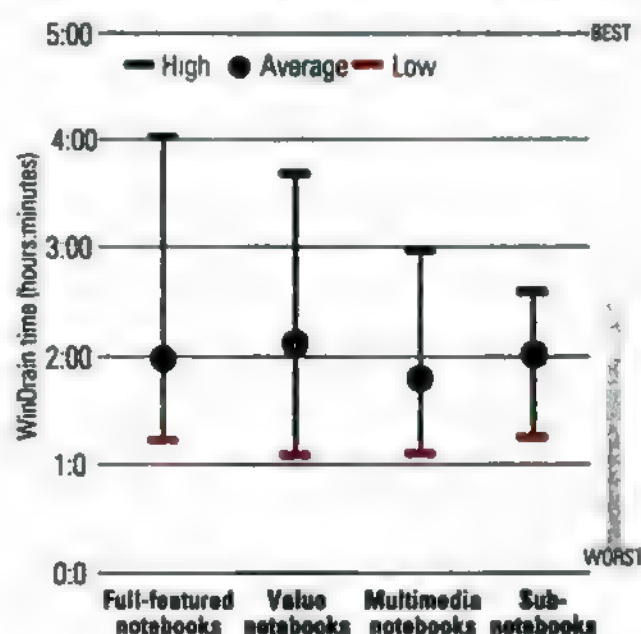
WINDRAIN

Our battery-life test demonstrated the benefit of lithium ion batteries over the most common alternative, nickel hydride batteries. While there are many other factors that influence battery life, lithium ion batteries lasted 1 hour longer than nickel hydride batteries, on the average. That's on our WinDrain test, which keeps the units completely active; you would likely see an even greater difference in less demanding, real-world usage.

We ran our ZDigit test, which exercises the notebooks in working and resting periods, to get a feel for battery life under more typical usage conditions. In many cases, battery life nearly doubled (the results are not reported for individual units).

Battery Life by Notebook Category

There's lots of variation in battery life within each notebook category. The average battery life on our strenuous WinDrain test was close to 2 hours.



OTHER TESTS

We do report results from our DOS tests, but we don't consider them particularly significant because these systems should all easily handle DOS applications.

For the 11 multimedia notebooks that included CD-ROM drives, we also ran CD-ROM performance tests.—
Analysis written by Richard Fisco

How We Tested

We enabled SMARTDRV.EXE in write-behind cache mode with cache sizes of 4MB (on systems with 16MB of RAM or more) or 2MB (on 8MB systems). For systems running WfWG, we set up a file cache of 4MB (on systems with 16MB or more) or 2MB (on systems with less than 16MB) and allowed Windows to shrink SmartDrive cache to 128K. We directed Windows to use a 20MB permanent swap file but did not change a vendor's setting for 32-bit disk access. We used each vendor's graphics driver and set resolutions to 640-by-480 with 256 colors and small fonts (even on notebooks capable of 800-by-600 resolution). We disabled power management features and any unnecessary drivers.

We used our benchmark test suite Winstone 95, Version 1.0, to measure the machines' performance when running typical Windows applications. Winstone 95 measures the time a PC takes to execute a set of scripts that exercise 13 of the best-selling Windows 3.1 applications. Winstone weights a given PC's test timings based on the applications' unit

market shares; it derives a composite number and converts it to a relative score (relative to the performance of a 386DX/25 Compaq Deskpro/M with 4MB of RAM, whose score is defined as 10). Winstone also produces scores in four categories: spreadsheet, word processing, database, and business graphics/desktop publishing. Each of these scores is relative to the Compaq Deskpro/M, whose score is defined as 1.

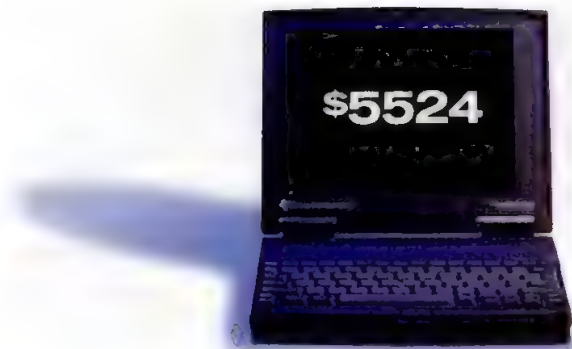
We used WinBench 95 to measure the performance of each machine's graphics subsystem under Windows. It generates the Graphics WinMark 95 score, which we report in millions of pixels per second. We also used WinBench to determine the Disk WinMark 95 score, a measure of disk subsystem performance under Windows.

We used PC Bench 9.0 as a measure of processor, video, and disk performance under DOS. The CPUmark₁₆ score indicates the speed of a PC's processor subsystem, including the CPU, cache, and system RAM. The DOS Disk score reflects the performance of a disk's subsystem under DOS. The DOS Video score indicates the speed of VGA text and graphics operations. The DOSMark score is a composite of those three results and approximates overall system performance under DOS.

The WinDrain score reflects the life of a PC's battery under intensive use with the power management disabled (including Microsoft Advanced Power Management, where applicable) and the screen at full brightness. We determine this score by running our WinDrain program until the battery is depleted. We expect the WinDrain time to represent the minimum battery life of a notebook. WinDrain writes constantly to a file and updates the screen to keep it active. During the test, we prevent each notebook from entering a power-saving mode by feeding keystrokes, either through an external keyboard port or by using a hardware device that taps a key.

Microsoft Corp. granted us permission to use VidTest, a tool for testing, to gauge the quality of multimedia playback. We use VidTest to determine CD-ROM Maximum Throughput—a drive's best-case data-transfer rate in kilobytes per second (KBps)—and CD-ROM CPU Utilization—the percentage of a CPU's bandwidth occupied by servicing the CD-ROM subsystem at 300 KBps in 16K blocks. We also use VidTest to determine the number of video frames dropped during playback of an AVI file. The file was encoded at 15 frames per second, 320-by-240 resolution, in 24-bit color and at a 150-KBps data rate.

We generated CD-ROM Database Search results by timing each PC as it performed a complex full-text search of the Ziff-Davis Computer Select CD-ROM.



TI Travelmate 5000, P75, 10.4" TFT, 8 MB RAM, 772 MB HDD



Toshiba T4900CT, P75, 10.4" TFT, 8 MB RAM, 772 MB HDD



Samsung SENS 800, P75, 10.4" TFT, 8 MB RAM, 772 MB HDD

Something here just does not compute.

A Pentium-based notebook shouldn't cost as much as a small car. That's why Samsung, one of the world's leading electronics manufacturers, offers this wonderful bit of technology for a whole lot less than the other well known brands.

So make sure you know your options. You'll see that Samsung is the only choice that makes sense.

SENS 800

**Pentium powered.
Spectacular price.**

SENS 800, 75 MHz Pentium, 10.4" color DSTN, 520MB HDD, 8MB RAM **\$2,799**

SENS 800, 75 MHz Pentium, 10.4" color TFT, 810MB HDD, 8MB RAM **\$3,299**

SENS 800, 90 MHz Pentium, 10.4" color TFT, 1.3GB HDD, 8MB RAM **\$3,799**

SENS 700

**Rugged dependability.
Full business audio.**

N700, DX2/50, 10.4" color DSTN, 340MB HDD, 4MB RAM **\$1,899**

N700, DX4/75, 10.4" color DSTN, 520MB HDD, 8 MB RAM **\$2,349**

N700, DX4/75, 10.4" color Active Matrix TFT, 520MB HDD, 8 MB RAM **\$2,749**

N700, DX4/100, 10.4" color Active Matrix TFT, 810MB HDD, 8 MB RAM **\$2,949**

SENS 800 & SENS 700 feature:

- Removable 2.5", 19mm height hard drive in your choice of capacity: 340, 520, 772MB, 1.3GB
- Up to 36MB RAM capacity
- Internal 3.5" floppy disk drive
- Two PCMCIA Slots. One Type II and one Type III can be used simultaneously
- 256K L2 cache (SENS 800 only)
- Parallel, serial, CRT, keyboard/keypad/mouse, cable manager, microphone jacks
- AT-compatible keyboard with built-in ergonomic track ball
- Infrared Data Transfer (SENS 800 only)
- Full business audio with built-in mic. and speakers
- Sparkling 10.4" color DSTN or 10.4" color Active Matrix TFT full size 640 x 480 display with 1 MB video RAM; local bus video/GUI accelerator; simultaneous LCD/CRT display
- NiMH batts. operate up to 3-4 hrs; free AC voltage adapter
- Only 11.3" x 8.9" x 2.1" and 6.2 lbs (DSTN color)
- Free carrying case

SENSLite 200

Full business audio

S200, DX2/50, 8.4" color DSTN, 340MB HDD, 4 MB RAM **\$1,799**

S200, DX4/75, 8.4" color DSTN, 520MB HDD, 4 MB RAM **\$2,199**

S200, DX4/75, 7.8" color Active Matrix TFT, 520MB HDD, 8 MB RAM **\$2,749**

- Easily accessible 2.5", 12.7mm height hard drive in your choice of 340, 520MB
- External 3.5" floppy disk drive included free
- Two Type II PCMCIA lots; can be used simultaneously
- Ports include parallel, serial, CRT, PS/2 keyboard/ keypad/mouse, cable manager, port adapter
- AT-compatible keyboard
- Integrated, easy-to-use-in-tight-places pointing device
- Full business audio with built-in mic. and speakers
- Advanced Power Management System

- Sparkling 8.3" color DSTN or 7.8" color active matrix TFT full size 640 x 480 display with 512K video RAM; local bus video/GUI accelerator
- Smaller than a letter-size sheet of paper: only 10.2" x 7.6" x 1.69" and weighs a scant 3.9 lbs (TFT color)
- NiMH batts. operate up to 3 hrs; free AC voltage adapter
- Free carrying case

WINDOWS '95 READY

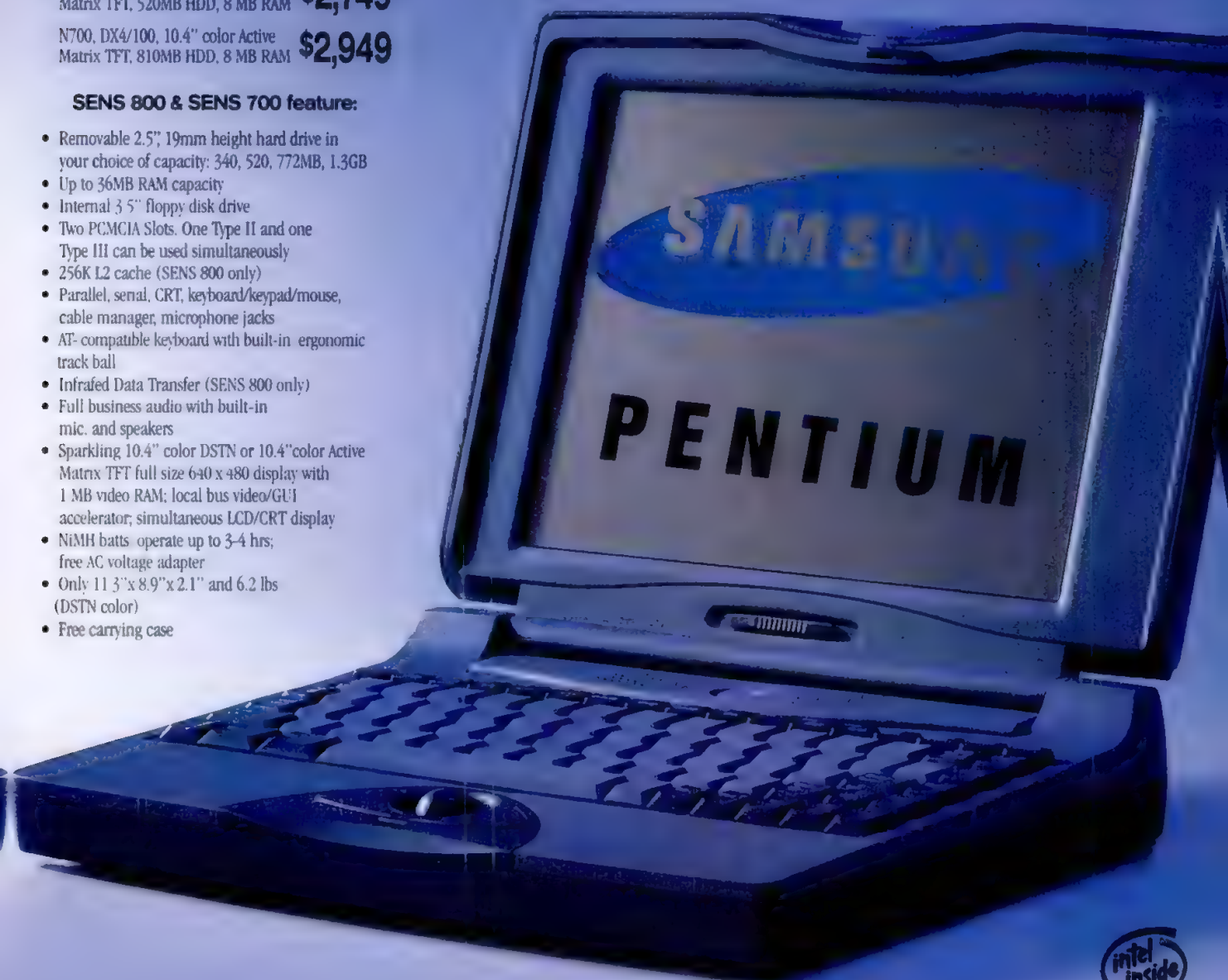
Windows '95 Plus 8MB RAM
Upgrade version

\$469



ELECTRONICS

1-800-656-2779



Free. One Year Executive Support Program. 24-hour turnaround on repairs. Call for details.

30-Day Money Back Guarantee, 2 year warranty on notebooks. Lifetime toll-free technical support. Complete with MS-DOS, Windows, BIOS shadowing, quick booting, and anti-virus software.

CIRCLE 278 ON READER SERVICE CARD



pentium™

Benchmark Tests: Full-Featured Notebooks

What the Numbers Mean

The 30 full-featured notebooks we tested for this roundup included machines equipped with processors ranging from DX4/75s to Pentium/100s. Not surprisingly, the systems that pair the best graphics and disk subsystems (including Microsoft Windows for Workgroups) with Pentium processors and L2 cache achieved the best scores on our Winstone 95 tests.

Led by FutureTech Systems' FutureMate FM309T, with a Winstone score of 136—about two-thirds the score of a fast 120-MHz Pentium desktop system—the Pentium/90-based notebooks stole the show. The FutureMate FM309T's first-place finish was also aided by its Chips & Technologies 65545 graphics chip set and IBM hard disk. Machines that lacked L2 cache or used slower DX2 processors did not fare well overall on our benchmark tests; machines that do not use Windows for Workgroups also faltered.

The top Graphics WinMark 95 performers in the full-featured category all use the C&T 65545 graphics engine. All of the top four finishers—MidWest Micro's SoundBook Plus, Wedge Technology's ShowBook P5, ARM Computer's ARMNote TS30PH, and the FutureMate FM309T—mate it to a PCI expansion bus.

We also saw a new graphics chip set from Cirrus Logic: the CL-GD7543. This chip set is a 32-bit accelerator with support

for 640-by-480 true-color displays, 800-by-600 displays, and motion-video acceleration. The two units that use the Cirrus Logic chip set—AST's Ascentia 950N and Texas Instruments' TI TravelMate 5000 75MHz Pentium TFT—scored reasonably well on our Graphics WinMark tests but were still unable to catch the top-finishing C&T 65545-based boxes. The last-place finisher on the Graphics WinMark tests, Astro Research's AstroNote SKD III, came equipped with the older, slower C&T 65540 graphics accelerator.

On our Disk WinMark 95 tests, the deciding factor was not whether the system used an Enhanced IDE hard disk but whether it was equipped with Windows for Workgroups, which supports a 32-bit file cache and outperforms SmartDrive alone. This is by far the biggest performance boost you can give to your hard disk—and to your notebook's overall performance.

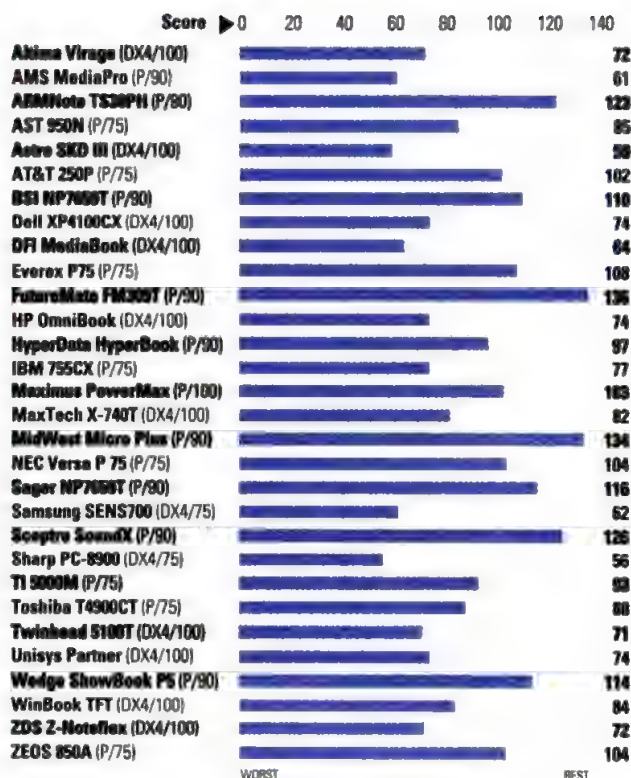
The best CPUmark₁₆ results—indicating performance of the processor and memory subsystems—came from notebooks with Pentium/90 processors and 256K of L2 cache. These machines outran Maximus Computers' PowerMax, which uses a faster 100-MHz Pentium processor but lacks L2 cache. Some of the slower Pentium/90 systems were trounced by 75-MHz Pentium notebooks, including AT&T's Globalyst 250P, which got a performance boost from its 256K of L2 cache.

The winner on our WinDrain battery test was the TI 5000, which lasted more than 4 hours thanks to its two lithium ion batteries. Second place went to Dell's Latitude XP4100CX: just under 3 hours.—*Analysis written by Richard Fisco*

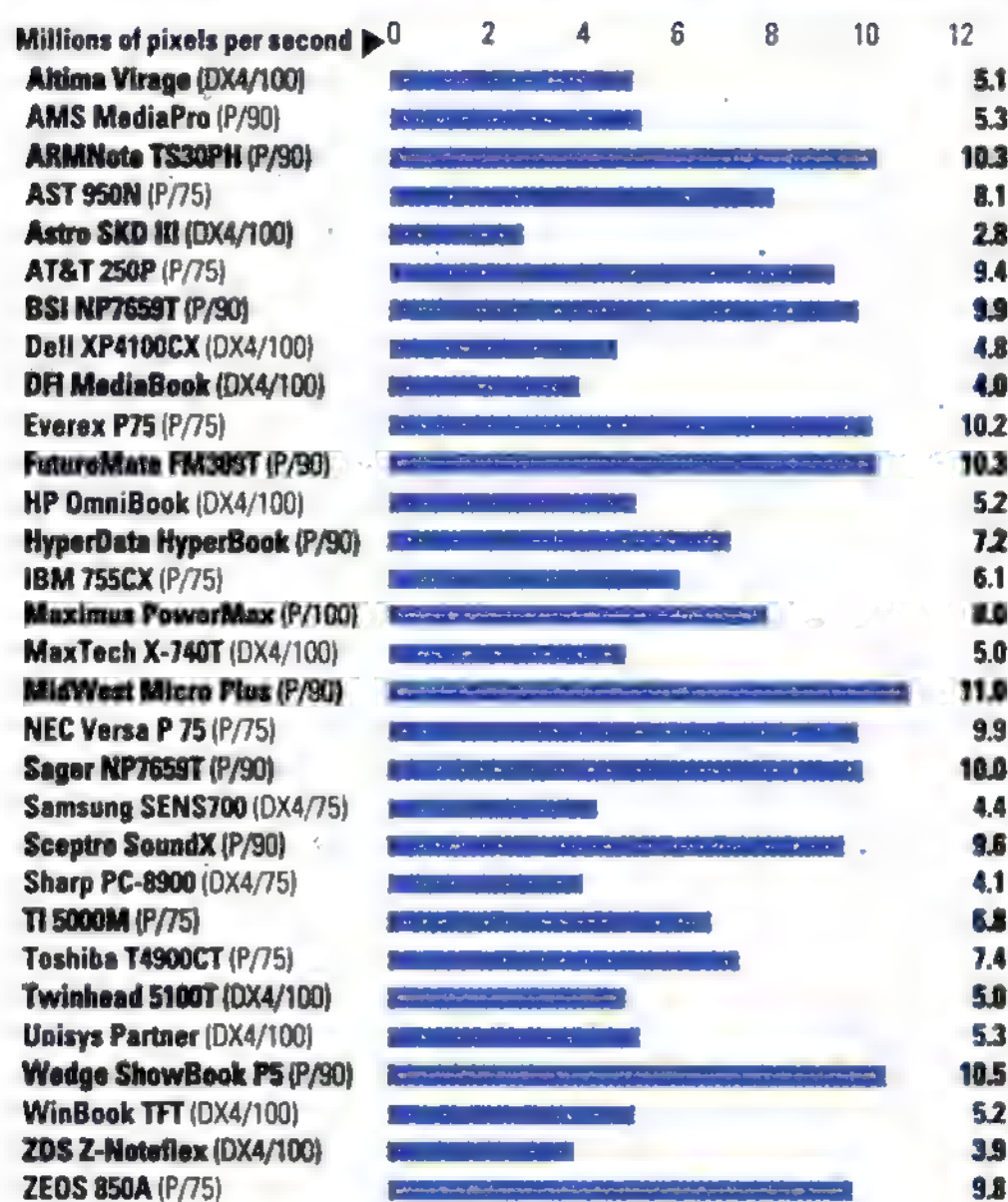
Red type denotes first place.
Higher scores represent better performance

	DOS			WINSTONE 95			
	DOS-Mark	Video	Disk	Spread-sheet	Word-Processing	Database	Business Graphics/DTF
Altima Virage DX4/100	514	4.435	440	7.0	7.2	8.7	8.3
AMS MediaPro	366	3.990	383	6.1	6.4	5.3	7.0
ARMNote TS30PH	397	2.725	163	10.8	12.0	12.4	15.8
AST 950N	734	2.722	503	8.2	8.2	8.2	9.7
AstroNote SKD III	401	2.937	400	5.5	5.8	5.5	7.0
AT&T 250P	774	3.343	519	9.7	10.1	9.9	11.4
BSI NP7699T	758	2.510	510	10.4	11.1	10.7	12.3
Dell XP4100CX	452	2.778	429	6.9	7.5	6.9	8.5
DFI MediaBook	486	3.814	391	6.4	6.2	6.0	7.2
Everex P75	780	3.668	513	10.2	10.6	10.8	12.0
FutureMate FM309T	424	2.738	178	12.4	13.8	13.4	15.8
HP OmniBook	487	4.421	381	7.1	7.5	7.2	8.0
HyperData HyperBook	664	3.048	441	9.3	9.9	9.0	11.2
IBM 755CX	620	3.541	331	7.0	7.9	7.7	8.5
Maximus PowerMax	715	3.121	467	9.8	10.5	9.6	11.9
MaxTech X-740T	498	2.930	448	7.8	8.2	7.7	9.3
MidWest Micro SoundBook Plus	488	2.734	205	12.3	13.3	13.4	15.8
NEC Versa P/75	777	3.337	524	9.8	10.5	10.1	11.6
Sager NP7699T	758	2.510	510	10.9	11.8	11.3	12.9
Samsung SENS700	424	2.543	381	6.0	6.2	5.7	7.0
Sceptre SoundX Pentium 90	387	2.742	157	11.6	12.6	12.5	14.5
Sharp PC-8900	383	3.696	319	5.5	5.6	5.1	6.2
TI 5000	694	3.149	444	8.7	9.2	9.2	10.4
Toshiba T4900CT	688	2.691	484	8.7	8.9	7.5	10.2
Twinhead 5100T	501	4.427	409	6.8	7.0	6.6	8.0
Unisys Partner	514	3.516	470	7.0	7.5	7.0	8.6
Wedge ShowBook P5	426	2.727	179	11.0	11.2	11.1	13.0
WinBook TFT	512	4.414	429	7.9	8.5	8.0	9.7
ZDS Z-Noteflex	408	2.691	343	6.9	7.2	6.9	8.2
ZEOS 850A	782	3.795	513	9.9	10.5	10.3	11.5

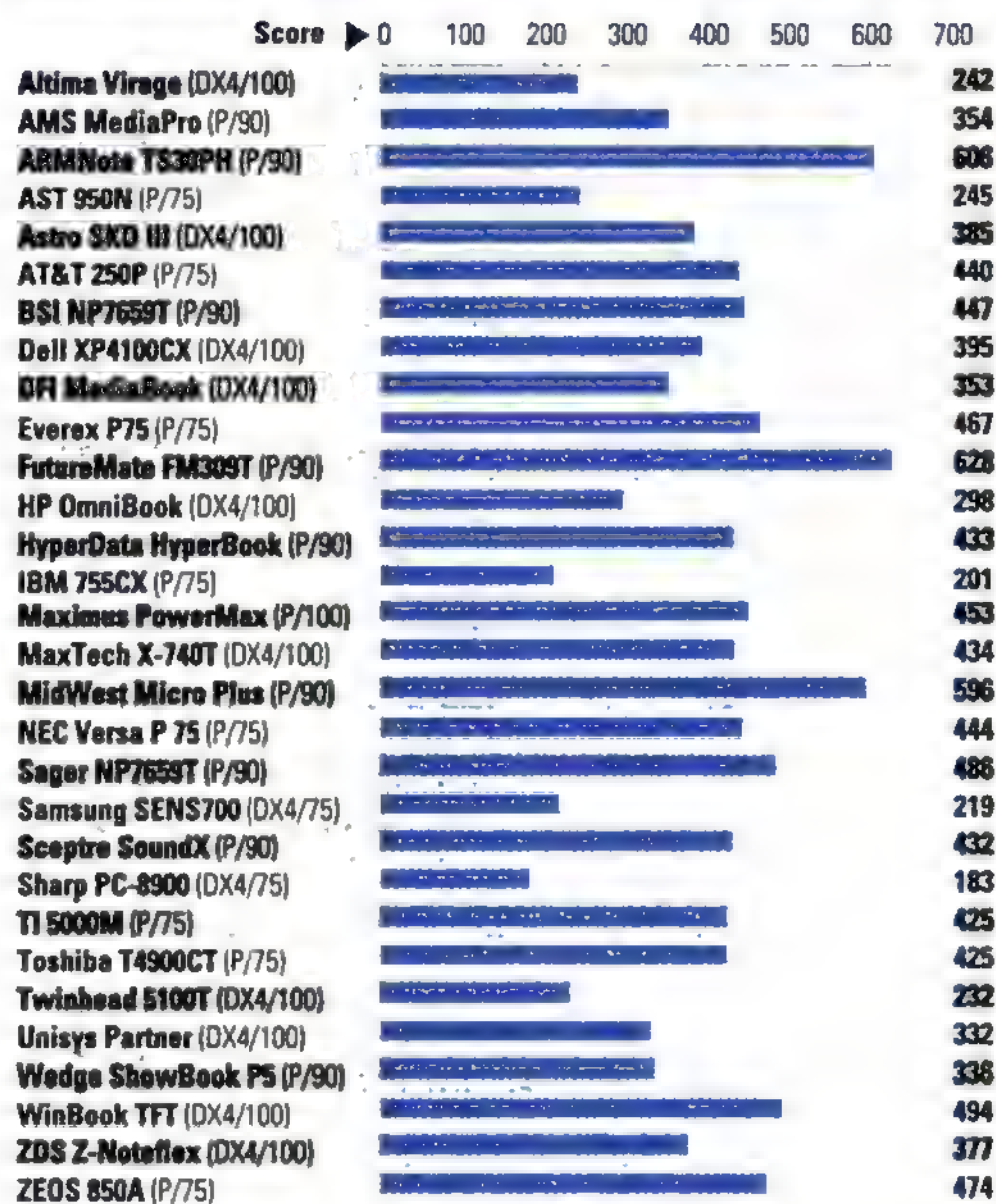
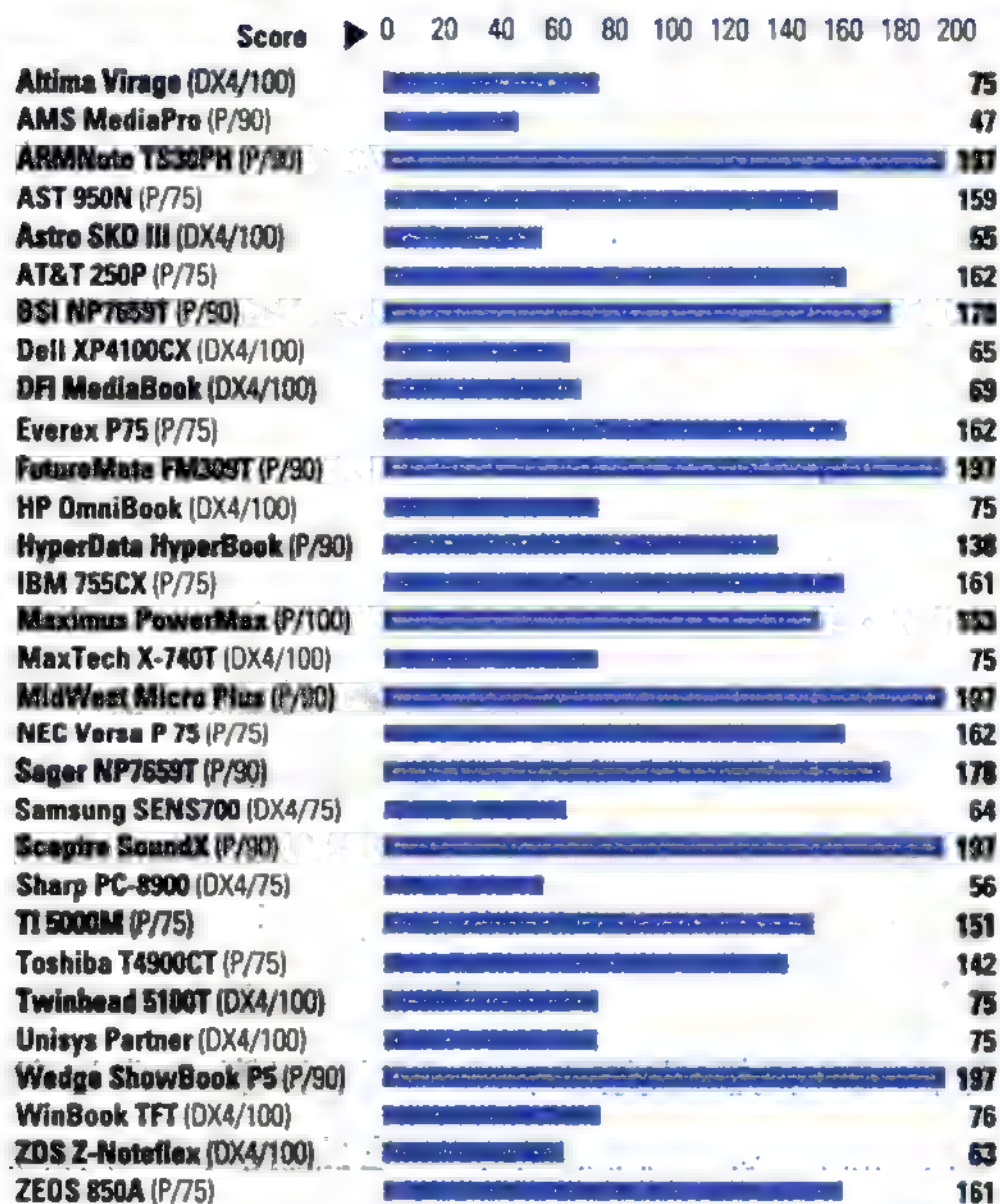
WINSTONE 95



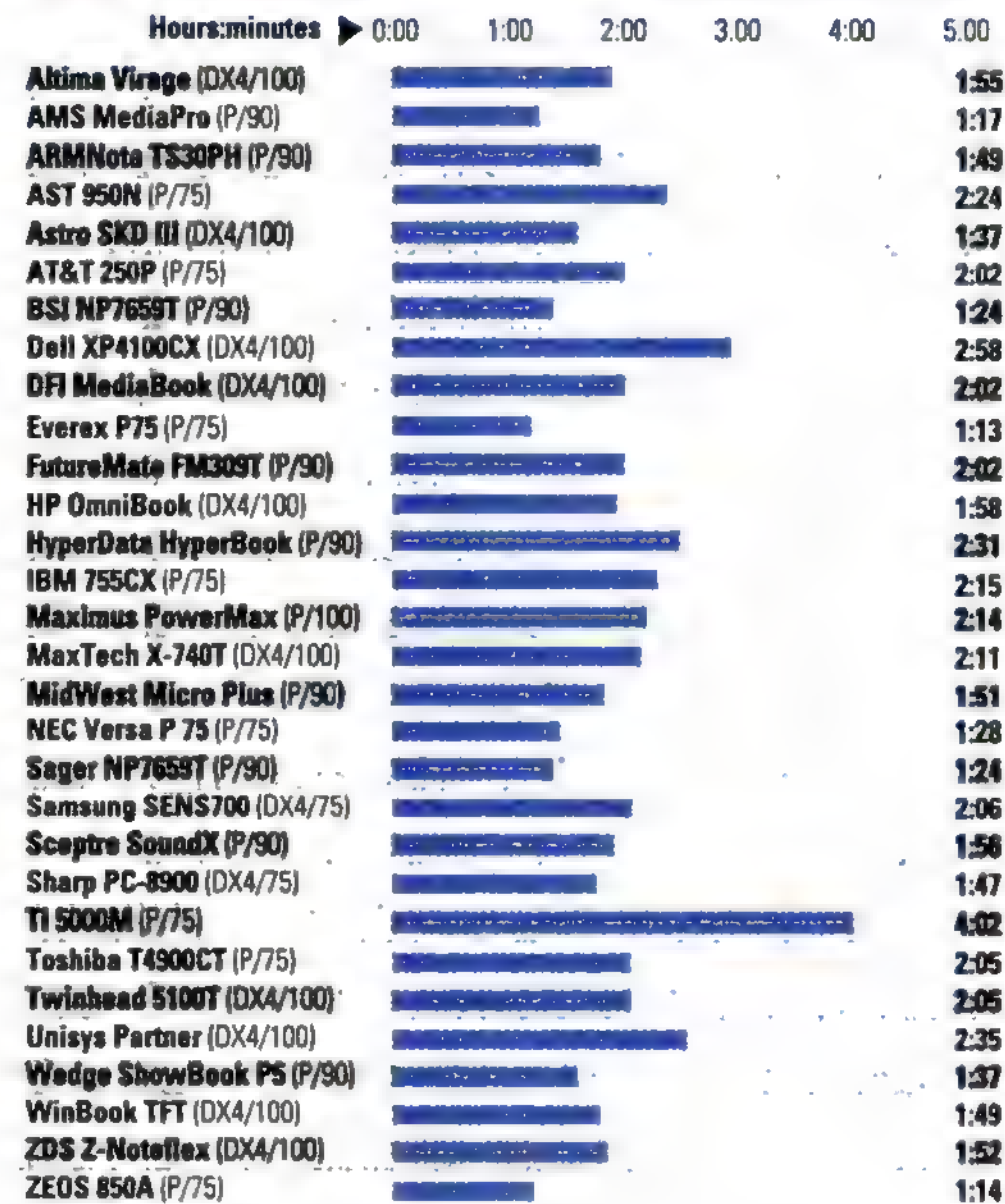
GRAPHICS WINMARK 95



DISK WINMARK 95

CPUMARK₁₆

WINDRAIN





Benchmark Tests: Value Notebooks

What the Numbers Mean

"Value" doesn't necessarily have to translate into "slow," as the benchmark test performance of the best of these 32 portable systems shows. The machines here use a variety of processors, ranging from pedestrian 486DX2/50s to powerful 75-MHz Pentium CPUs. Two Cyrix processors, a Cx486DX2-66 and a Cx486DX2-80, appeared in this value notebook category as well—but the machines they powered couldn't match the performance of systems equipped with comparable Intel CPUs.

The first-place Winstone 95 score was posted by Sceptre Technologies' SoundX Series 3000 Pentium 75, which mated a 75-MHz Pentium CPU and 256K of L2 cache to 16MB of RAM and a PCI bus. In general, the leading scorers on our Winstone tests used 16MB of RAM, which, as we have found in previous testing, provides a performance boost of as much as 75 percent over comparably configured notebooks with only 8MB of RAM (albeit at a price).

The last-place finisher on the Winstone tests, Novacor's Nova OpenNote, shows how a rock-bottom price can translate into rock-bottom performance. This machine uses a slow Cyrix Cx486DX2-66 processor, 8MB of memory, no L2 cache, and an ISA-based graphics accelerator. This combination resulted in the system turning in a Winstone score of only

28. (The OpenNote also lacks Microsoft Windows for Workgroups, which can significantly speed disk accesses.)

The top six performers on our Graphics WinMark 95 tests all used the Chips & Technologies 65545 graphics accelerator. Boosted by a Pentium/75 CPU, ZEOS's Meridian 850C grabbed the top position. Incidentally, we are reporting the results for all the machines here at standard VGA (640-by-480) resolution, but the ZEOS 850C also supports Super VGA (800-by-600) resolution on its LCD panel. Stepping the ZEOS system up to 800-by-600 resolution reduces the machine's Graphics WinMark performance by about 5 percent.

The ZEOS 850C again finished first on our Disk WinMark 95 tests. This system was helped by a Toshiba 504MB hard disk and Windows for Workgroups, and it also had the benefit of a Pentium/75 processor.

Not surprisingly, the best CPUmark₁₆ scores were earned by the machines with the fastest processors, which were Pentium/75s. Sceptre's SoundX Series 3000 Pentium 75 was able to edge out the ZEOS 850C for top honors. The BSI NP7657D, from Broadax Systems, trailed the Pentium pack, at least partly because of its slower (25-nanosecond) L2 cache.

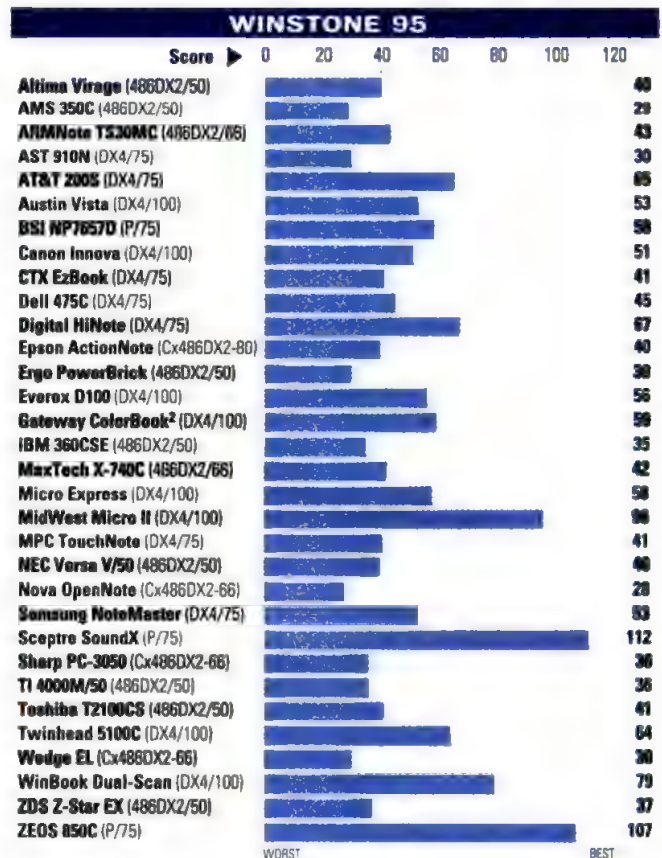
On our WinDrain battery test, the one lithium ion battery pack found in this category proved its worth. AST Research's Ascentia 910N posted a 3-hour-40-minute WinDrain score.

The second-place finisher in this category, Gateway's ColorBook² DX4/100, lasted just over 3 hours using a nickel hydride battery.—*Analysis written by Richard Fisco*

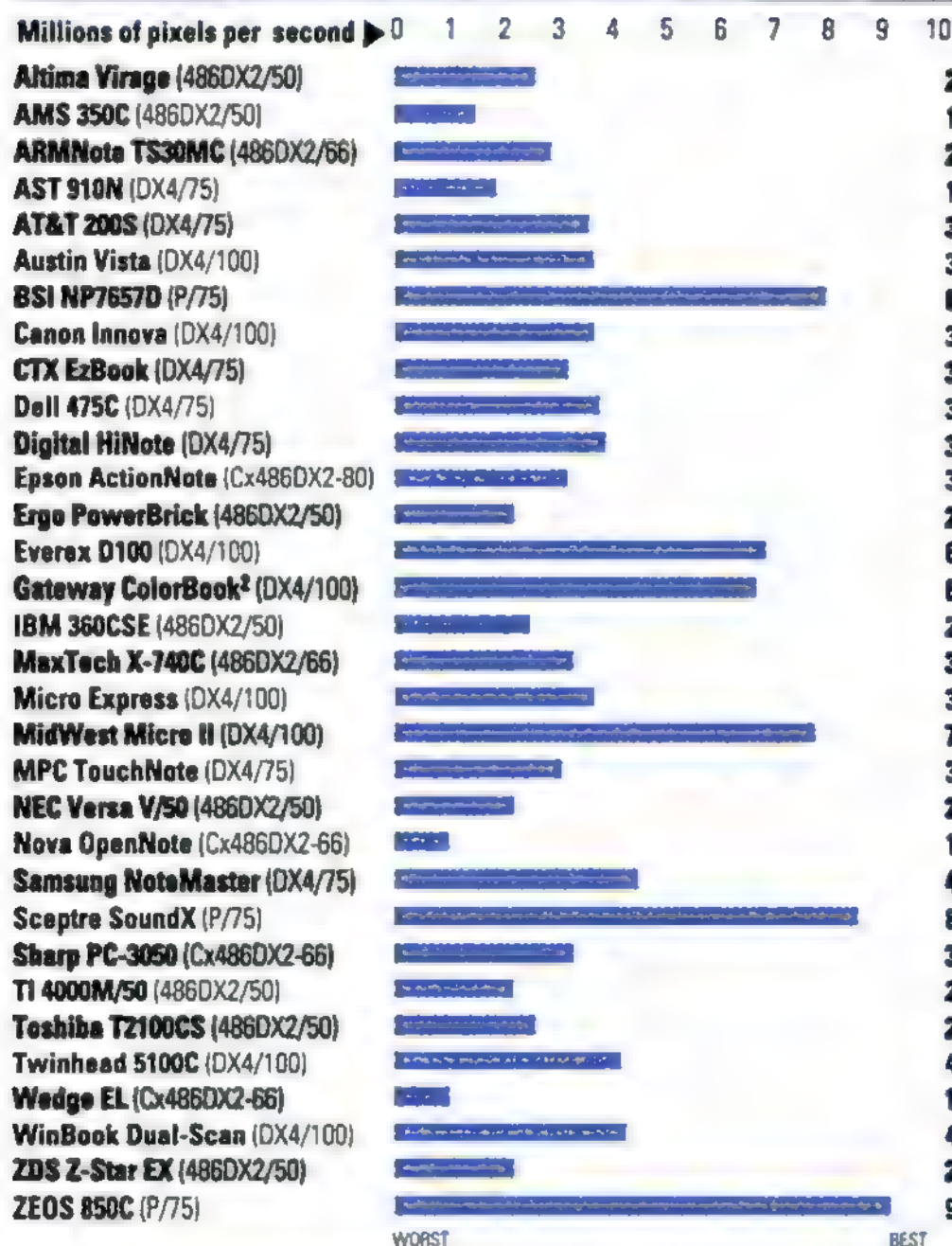
Red type denotes first place.

Higher scores represent better performance.

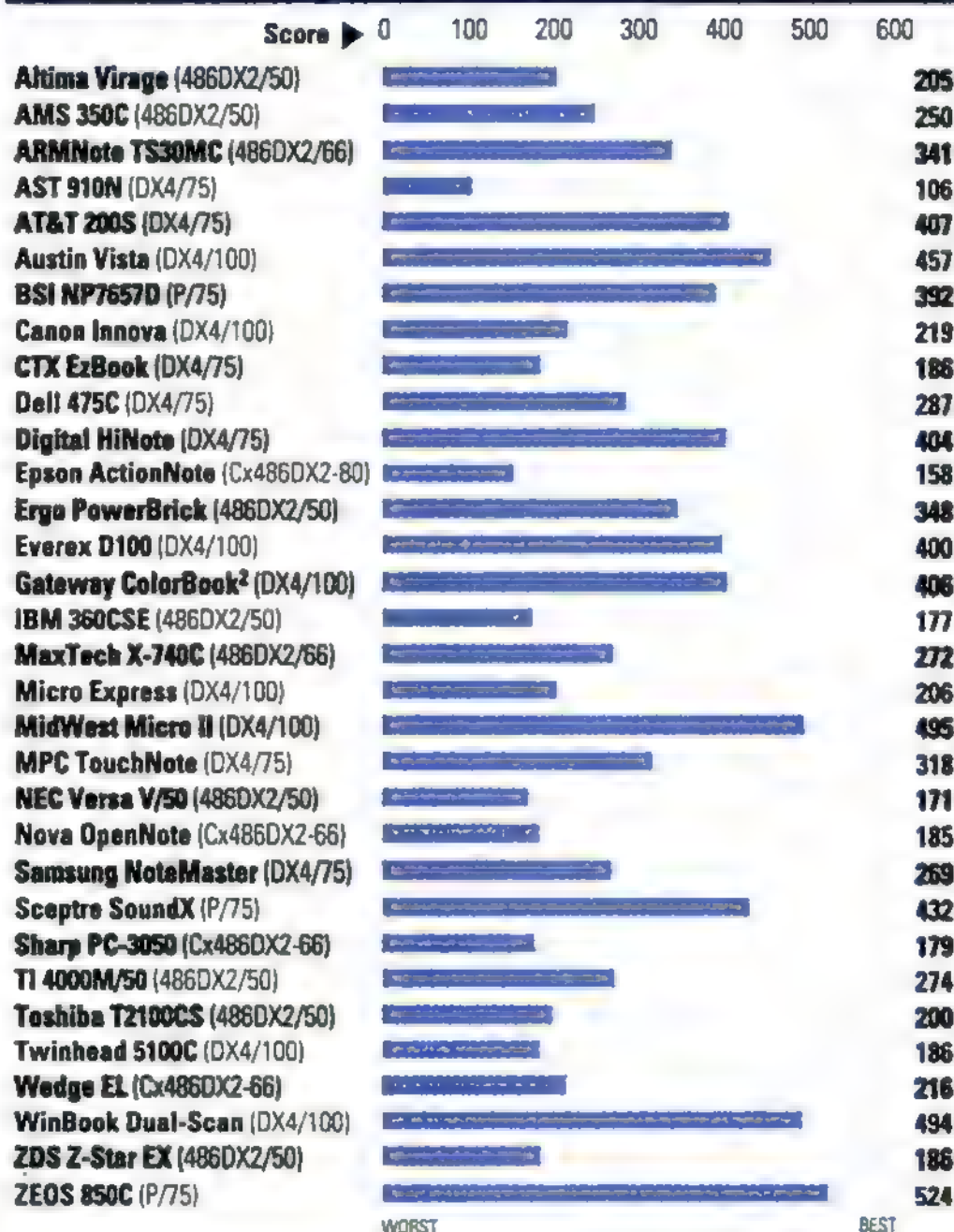
	DOS			WINSTONE 95			
	DOS-Mark	Video	Disk	Spread-sheet	Word Processing	Data-base	Business Graphics/DTP
Altimira Virage	344	3,451	277	4.0	4.1	3.3	4.5
AMS 350C	266	1,806	222	2.9	3.0	2.5	3.4
ARMNote T330MC	396	2,107	327	4.4	4.5	3.5	4.9
AST 910N	388	2,550	349	3.0	2.9	2.8	3.3
AT&T 200S	417	2,225	381	6.5	8.1	6.1	7.7
Austin Vista	353	1,877	221	5.4	5.4	4.5	6.1
BSI NP7657D	680	1,904	499	5.8	6.1	4.7	6.5
Canon Innova	344	1,859	210	5.2	5.4	4.2	5.9
CTX EzBook	345	3,189	326	4.1	4.2	3.4	4.6
Dell 475C	446	2,416	374	4.6	4.6	3.8	5.1
Digital HiNote	409	2,617	383	6.7	6.4	6.2	7.6
Epson ActionNote	409	2,863	286	3.8	4.2	3.5	4.8
Ergo PowerBrick	310	2,586	256	3.8	2.1	3.1	4.4
Everex D100	513	2,962	448	5.7	6.0	4.4	6.3
Gateway ColorBook ²	512	3,419	466	6.0	6.2	4.8	6.6
IBM 360CSE	319	3,569	250	3.5	3.6	2.9	3.9
MaxTech X-740C	396	2,273	321	4.4	4.4	3.5	4.8
Micro Express	459	2,868	404	5.6	5.6	5.6	6.5
MidWest Micro II	574	4,301	489	9.7	9.3	8.8	10.7
MPC TouchNote	352	3,189	351	4.2	4.2	3.4	4.7
NEC Versa V/50	273	3,484	231	4.0	3.9	3.7	4.6
Nova OpenNote	318	1,768	288	2.7	2.7	2.6	3.5
Samsung NoteMaster	436	2,536	417	5.4	5.5	4.5	6.1
Sceptre SoundX	325	2,250	133	11.1	10.5	11.1	12.9
Sharp PC-3050	306	2,313	220	3.7	3.9	2.9	4.0
TI 4000M/50	376	2,426	278	3.7	3.8	3.1	4.0
Toshiba T2100CS	323	1,931	271	4.2	4.3	3.5	4.6
Twinhead 5100C	474	3,988	362	6.2	6.1	6.1	7.2
Wedge ShowBook EL	341	1,768	331	2.8	2.8	2.8	3.8
WinBook Dual-Scan	518	4,003	453	7.9	7.2	7.7	9.3
ZDS Z-Star EX	310	2,061	256	3.7	3.8	3.0	4.2
ZEOS 850C	799	3,903	534	10.7	9.9	10.7	11.9



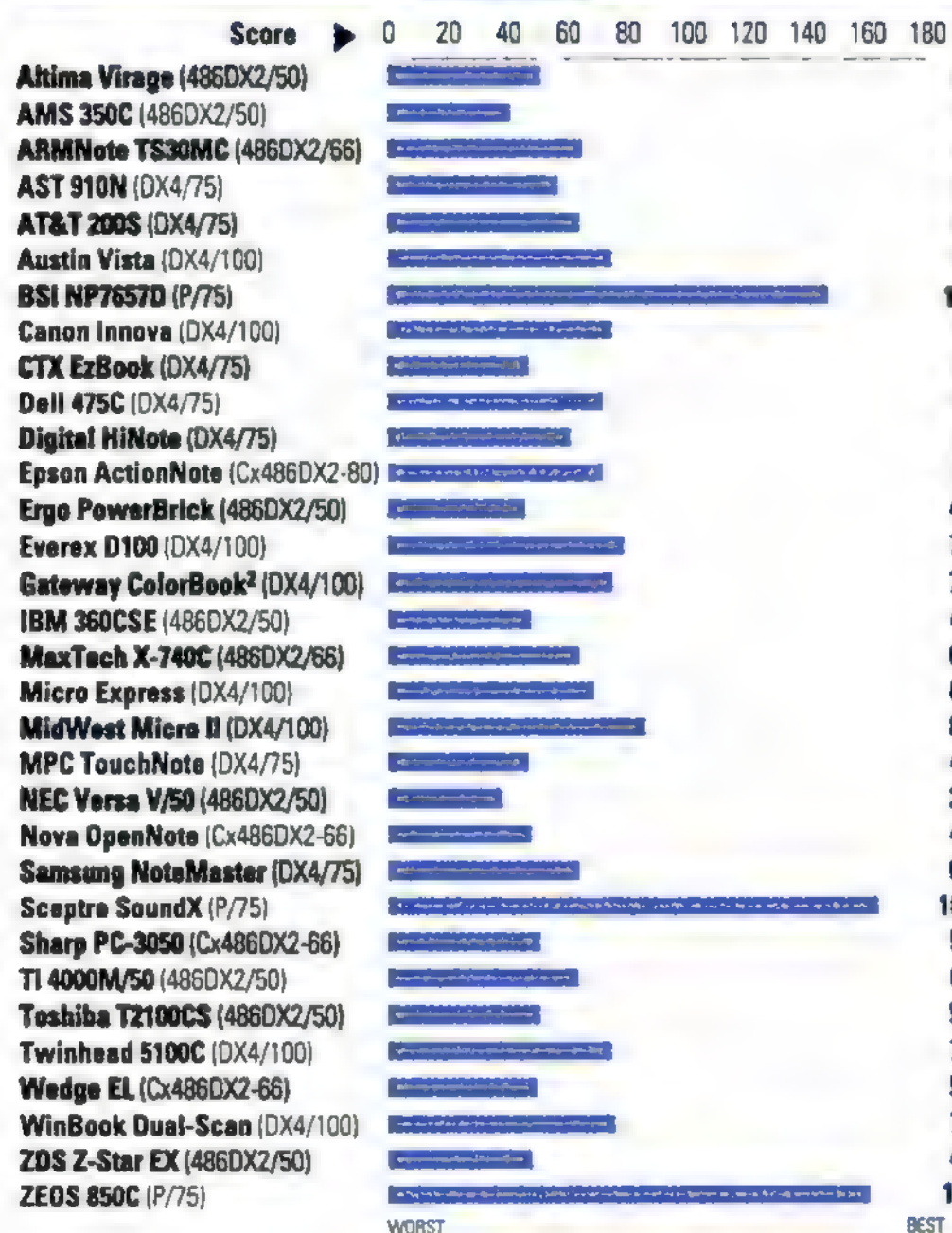
GRAPHICS WINMARK 95



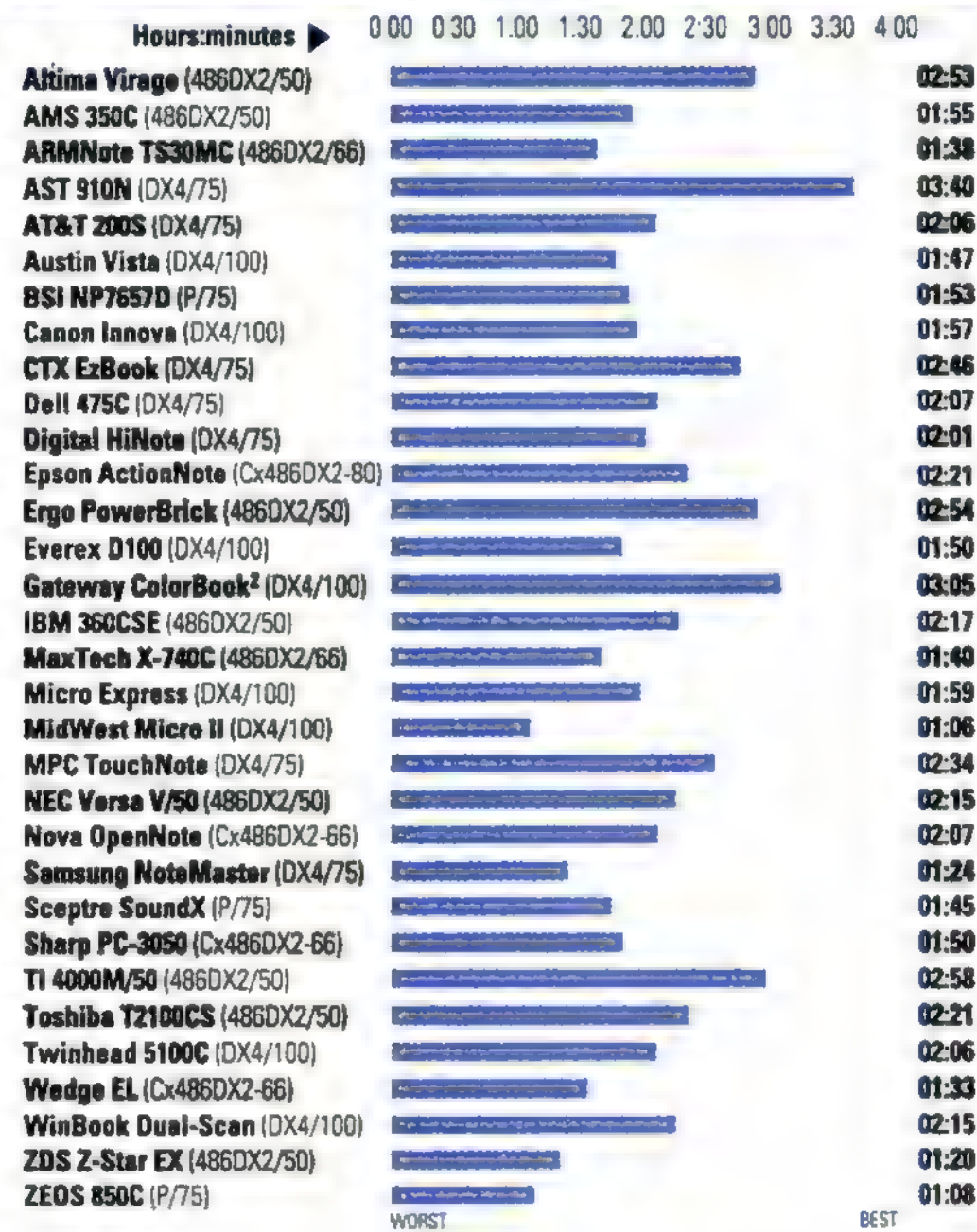
DISK WINMARK 95



CPUMARK16



WINDRAIN





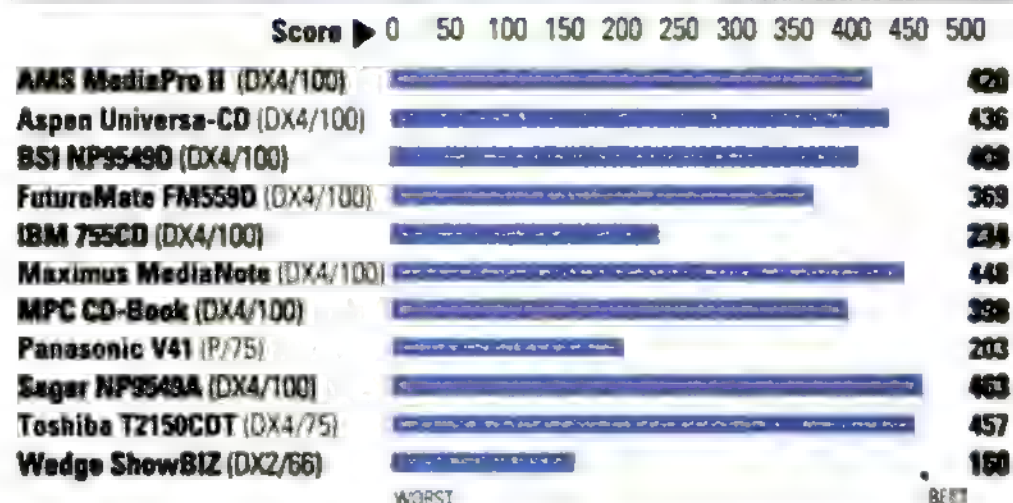
Benchmark Tests: Multimedia Notebooks

What the Numbers Mean

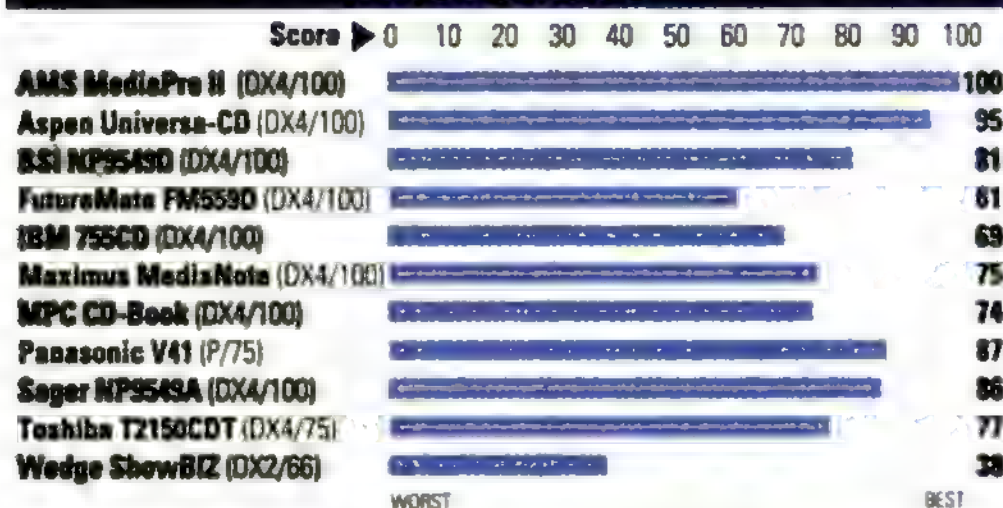
For pure performance among CD-ROM-equipped notebooks, look at AMS's MediaPro II and Aspen's Universa-CD. These units used DX4/100 CPUs and Microsoft Windows for Workgroups to earn them the top two Winstone 95 scores. The Universa-CD also benefited from 256K of L2 cache.

The Pentium/75-based Panasonic V41 posted the highest Graphics WinMark 95 and CPUmark₁₆ scores. But because Panasonic installed Microsoft Windows 3.11 rather than Windows for Workgroups, the unit posted a next-to-last-place Disk WinMark 95 score. This poor disk performance pulled the Winstone score down to a third-place 87.—Analysis written by Richard Fisco

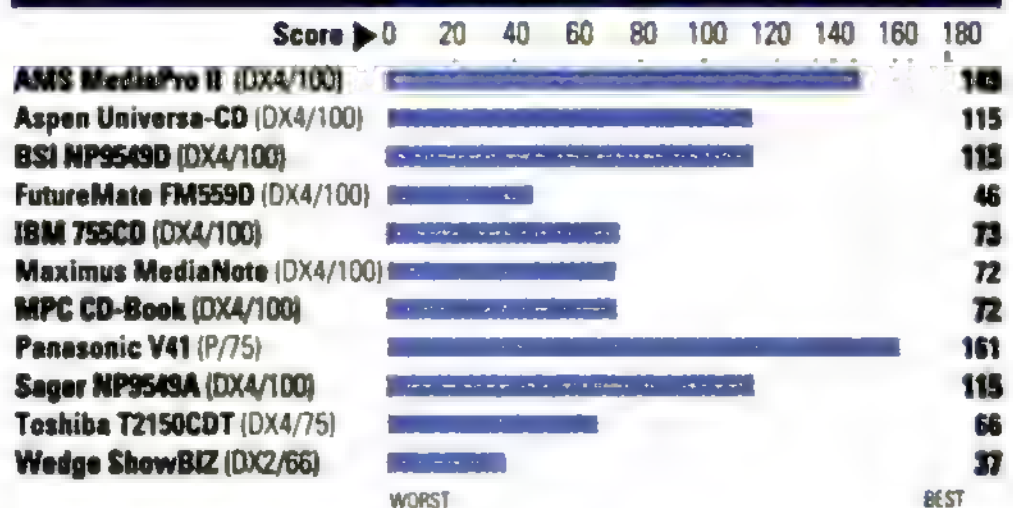
DISK WINMARK 95



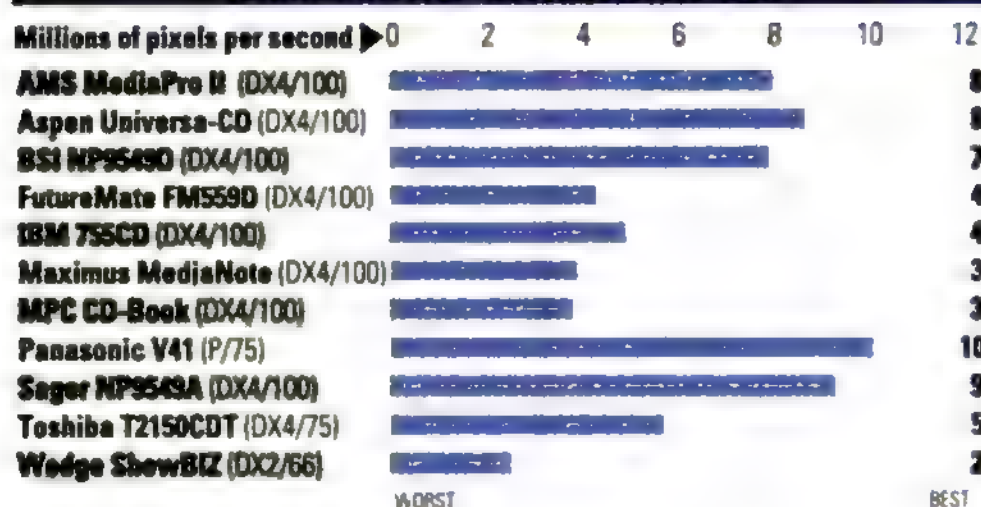
WINSTONE 95



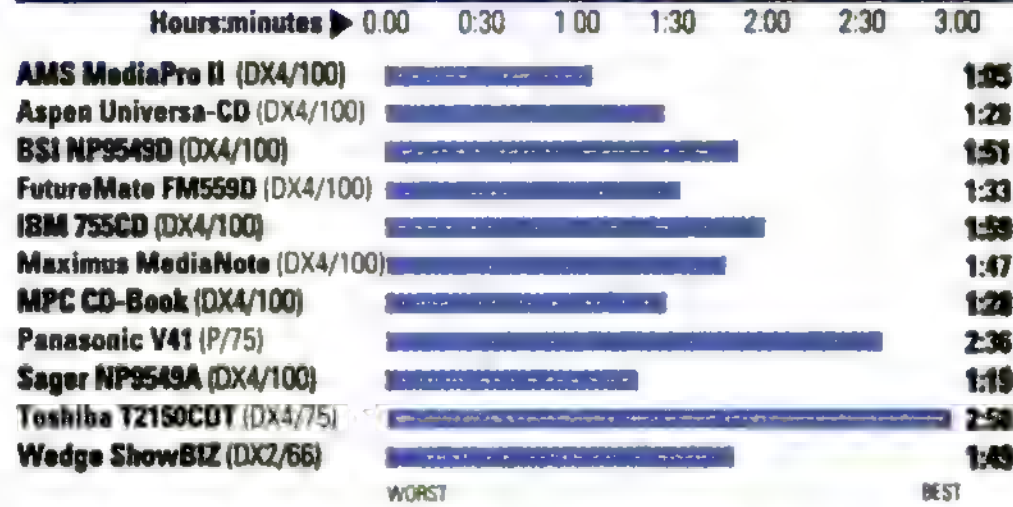
CPUMARK₁₆



GRAPHICS WINMARK 95



WINDRAIN



DOS

WINSTONE 95

CD-ROM

Red type denotes first place.

▲ Higher scores represent better performance.

▼ Lower scores represent better performance.

	DOSMark	Video	Disk	Spread-sheet	Word Processing	Database	Business Graphics/DTP	Database Search (min:sec)	Video Frames Dropped (of 912)	CPU Utilization (%)	Maximum Throughput (KBps)
AMS MediaPro II (DX4/100)	675	3,280	419	10.1	9.5	9.3	11.4	3:30	0	45	300
Aspen Universa-CD (DX4/100)	652	3,854	473	9.5	9.0	9.2	10.5	8:25	0	80	300
BSI NP9549D (DX4/100)	610	2,004	514	8.3	7.3	8.3	8.9	7:59	7	79	300
FutureMate FM559D (DX4/100)	350	2,685	372	6.4	6.1	5.3	7.0	3:35	0	45	300
IBM 755CD (DX4/100)	487	2,904	439	6.9	6.6	6.4	8.0	3:17	0	46	300
Maximus MediaNote (DX4/100)	457	2,039	429	7.5	6.9	7.1	8.8	6:37	0	50	300
MPC CD-Book (DX4/100)	455	2,040	422	7.3	6.8	7.1	8.6	6:24	0	51	300
Panasonic V41 (P/75)	711	3,679	424	8.5	8.7	8.3	9.6	5:45	0	39	301
Sager NP9549A (DX4/100)	670	3,734	511	8.9	7.8	8.8	9.4	4:38	0	83	300
Toshiba T2150CDT (DX4/75)	449	3,070	404	7.9	7.5	7.0	8.7	5:16	0	32	300
Wedge ShowBIZ (DX2/66)	265	3,361	231	3.9	3.8	3.3	4.2	9:28	8	82	300



Your workgroups get the HP LaserJet 4V network printer. And you get \$250 off. What a steal!



Under \$2,200*

The HP LaserJet 4V with HP JetDirect card, after rebate. The HP LaserJet 4MV is under \$2,800 after rebate.

For a limited time, HP will take \$250 off the price of either the HP LaserJet 4V with a qualifying HP JetDirect card or the LaserJet 4MV. But savings aside, you just won't find a better solution for the needs of a busy workgroup. First of all, these mid-volume network printers are fast. They clock in at 16 ppm, fueled by a 33.3-MHz RISC-based processor. Each one accepts a wide variety of paper sizes. And, because they feature HP JetAdmin printer

management software, printing will be noticeably smoother for everyone involved. For more information about the printers and the rebate, see your nearest authorized HP dealer.

HP Network Printers
Just what you had in mind.



**HEWLETT®
PACKARD**



Benchmark Tests: Subnotebooks

What the Numbers Mean

Don't be fooled: The diminutive size of these seven subnotebooks doesn't mean they're underpowered. The clear leader was Gateway 2000's Liberty DX4/100 Best Buy, which uses components suitable for a midrange desktop: a DX4/100 processor, 256K of external-processor cache, a Chips & Technologies 65545 graphics accelerator, and a whopping 24MB of RAM. This combination led to first-place results on all four of our primary benchmark test suites: Winstone 95, Graphics WinMark 95, Disk WinMark 95, and CPUmark₁₆. Add to this a 10.4-inch dual-scan display and you have a powerful portable.

The Liberty's nickel hydride battery pack contributed to a respectable score of 2 hours 35 minutes on our WinDrain battery test. Just as we were finishing this story, Gateway supplied a lithium ion replacement battery that managed to last more than 3 hours on the same test. From a performance perspective, the Liberty is the one subnotebook we tested for this roundup that won't force you to compromise.

We were disappointed by IBM's ThinkPad 701C. Even with a small case, a full-size keyboard, a 14.4-Kbps internal modem, an IrDA-compliant infrared port, a 10.4-inch active-matrix screen, and a DX4 processor, it didn't live

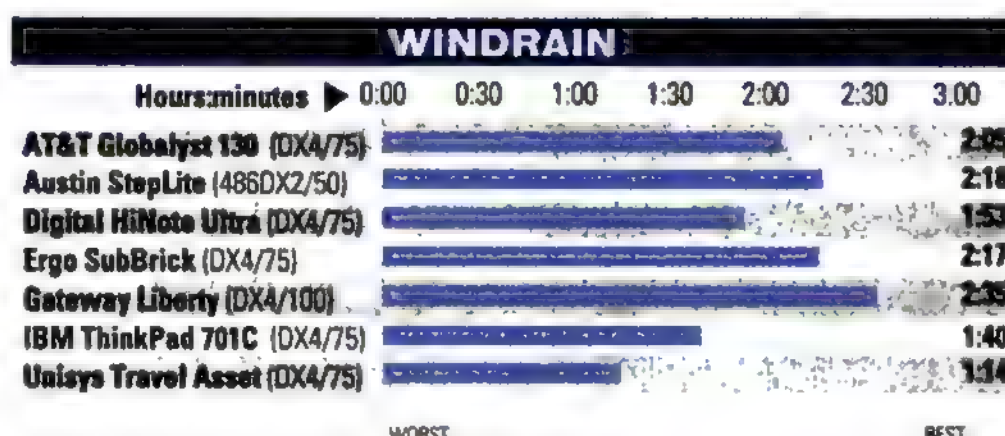
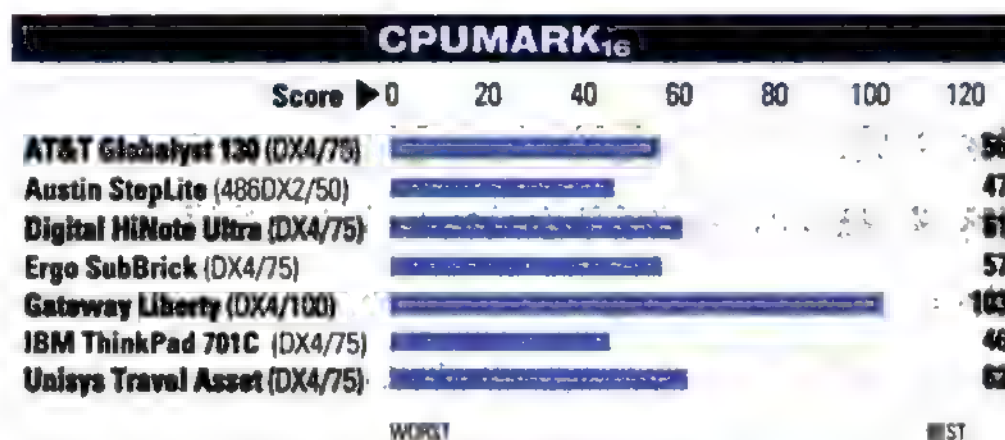
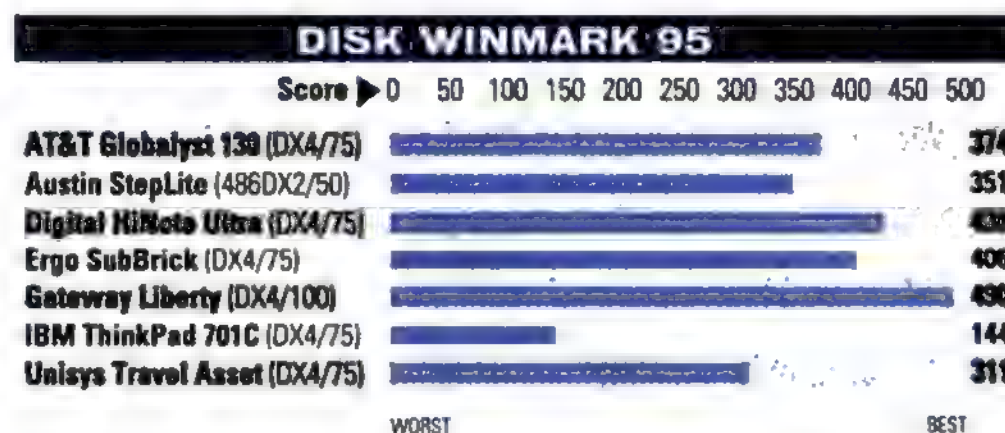
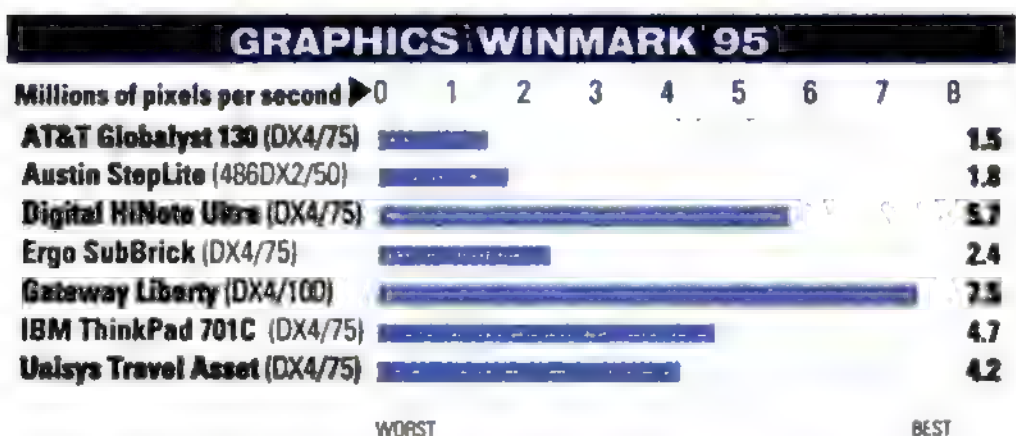
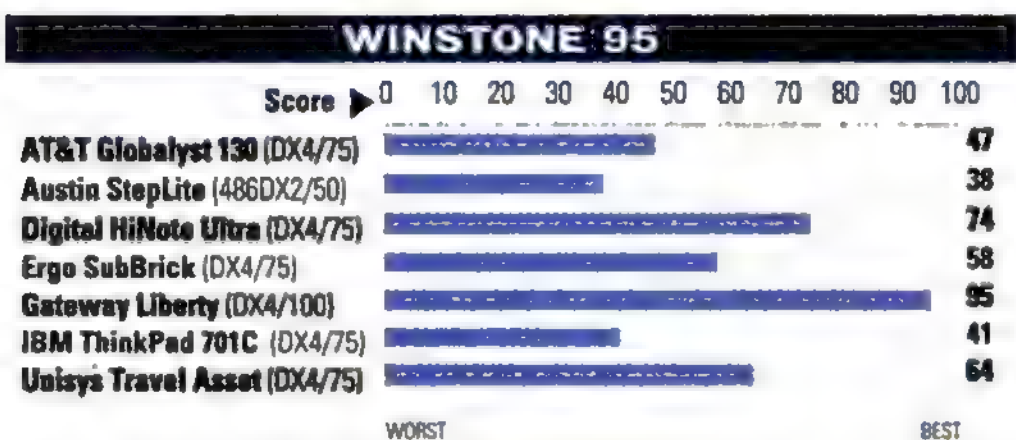
up to our expectations. The IBM 701C does not use its 75-MHz DX4 processor to much advantage. In fact, the machine produced nearly the same Winstone score as the 486DX2/50-based version we had previously tested (First Looks, *PC Magazine*, March 14, 1995). And the DX4/75-based IBM 701C's CPUmark₁₆ score barely matched the average score of the 486DX2/50-based notebooks we tested for this roundup. The culprit behind these low test scores seems to be a slow memory subsystem (and the lack of L2 cache), combined with a slow disk subsystem and the use of Microsoft Windows 3.1 instead of Windows for Workgroups 3.11.

The IBM 701C was also the only notebook of any kind in this roundup to use dated nickel cadmium battery technology—a shame in a machine that's designed to be a road warrior's dream. The IBM 701C fell seriously short of the 2-hour mark on our WinDrain test; its score was 1:40.

Austin Direct's StepLite Notebook was outclassed by this roundup's other subnotebooks; it has a relatively lowly 486DX2/50 processor, 8MB of memory, and the older C&T 65535 graphics accelerator. The StepLite's performance was average for a 486DX2/50-based notebook, but the speedier processors and support components used by competing systems in the subnotebook class left it in the dust.—*Analysis written by Richard Fisco*

	DOS			WINSTONE 95			
	DOS-Mark	Video	Disk	Spread-sheet	Word Processing	Data-base	Business Graphics/DTP
AT&T Globalyst 130	361	1,549	349	4.5	4.3	4.8	6.0
Austin StepLite	292	1,842	232	3.8	3.8	3.2	4.5
Digital HiNote Ultra	418	3,617	359	7.5	7.2	6.7	8.1
Ergo SubBrick	382	1,848	380	5.7	5.4	5.5	7.1
Gateway Liberty	577	1,989	508	9.4	9.0	9.2	10.7
IBM ThinkPad 701C	310	2,985	248	4.0	4.2	3.6	4.5
Unisys Travel Asset	426	2,748	393	6.5	6.0	6.0	7.4

Red type denotes first place.
Higher scores represent better performance.





Road Warriors' Companion

PC MAGAZINE'S 1995 GUIDE TO COMPUTING ON THE ROAD

By Bill Howard

Notebook PCs can make working from the road a reality. To make the most of your mobile office, you should know some of the tricks of the trade. In this special section, we've compiled the critical information you're likely to need while traveling.

- A road warriors' checklist to make sure you don't leave anything behind.
- Phone numbers and communications parameters for major on-line services.
- Phone numbers for major hotels and airlines as well as for car-rental and overnight-delivery services.
- Tips on transmitting data from the road—how to skirt common communications problems.
- Hints on what you'll need to bring for major overseas destinations.
- A fill-in section you can use to record critical personal information, such as dial-in numbers to

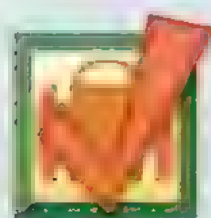
retrieve your voice mail and e-mail.

- Sources for hard-to-find travelers' accessories.
- A list of basic modem commands you can use in terminal-emulation mode or add to the initialization strings in your comm software.
- Customer information and technical-support numbers for the top ten notebook vendors.

We also recommend that you tape business cards to your notebook computer, transformer, external modem, and floppy disk drive. That way, if you leave part of your PC in the hotel in your mad dash to the airport, you're more likely to get it back.

FEATURES PLUS

This section's contents are available on PC Magazine's Editorial Forum on ZiffNet: Type GO EDITOR, then search on "Road Warrior." Or go to our World-Wide Web page at <http://www.ziff.com/~pcmag>.



TRAVELERS' CHECKLIST

Make sure you don't forget the essentials; check through this list before you leave. Use a felt-tip or ballpoint pen to fill in key personal information below.

CRITICAL ITEMS

- ☐ Notebook computer
- ☐ Notebook AC adapter and cables
- ☐ Modem, connector cable, and AC adapter
- ☐ RJ-11 phone cord
- ☐ Electrical and phone adapters for international use
- ☐ Business cards
- ☐ Day-planner and meeting schedule
- ☐ Cash, traveler's checks, local currency
- ☐ Tickets, itinerary, directions
- ☐ Passport and necessary visas

REMEMBER TO:

- ☐ Charge notebook batteries.
- ☐ Change voice mail message.
- ☐ Set up desktop PC for remote access.
- ☐ Transfer working files to notebook.

OPTIONAL ITEMS

- ☐ Spare notebook battery
- ☐ Blank floppy disks
- ☐ Bootable floppy disk
- ☐ In-line RJ-11 coupler
- ☐ Acoustic coupler
- ☐ RJ-11 "Y" splitter
- ☐ 120VAC inverter
- ☐ Short printer cable
- ☐ 3-prong-to-2-prong AC adapter

- ☐ AC extension cord or power strip
- ☐ Cellular phone (and charger, spare battery, car adapter)
- ☐ Pager
- ☐ Blank airbills (Federal Express, Airborne Express, and so on)
- ☐ Phone-line tester
- ☐ Toolkit (needle-nose pliers, screwdriver, pocketknife, alligator clips, small flashlight)
- ☐ Velcro cable ties

PERSONAL INFORMATION

Your voice mail system's remote dial-in phone number: _____

Your e-mail system's remote dial-in phone number: _____

Bps: _____ parity: _____ stop bits: _____

Your PC's dial-in line: _____

Bps: _____ parity: _____ stop bits: _____

Your travel agent's phone number: _____

Your notebook's serial number: _____



COMPUSERVE ACCESS

It pays to get CompuServe local access numbers before you travel. But in case you forget, here are numbers that work in major U.S. cities.

TOLL-FREE ACCESS

300, 1,200, 2,400 bps	800-848-4480
9,600, 14,400 bps	800-331-7168
28,800 bps	800-454-8327

9,600- OR 14,400-BPS LOCAL ACCESS NUMBERS

Albuquerque, New Mexico	505-268-8748
Atlanta, Georgia	404-841-0578
Austin, Texas	512-328-1155
Baltimore, Maryland	410-494-8403
Boise, Idaho	208-344-3712
Boston, Massachusetts	617-426-9295
Chicago, Illinois	312-201-0711
Cincinnati, Ohio	513-771-0592

Dallas, Texas	214-720-9183
Denver, Colorado	303-595-0123
Detroit, Michigan	313-535-1488
Honolulu, Hawaii	808-528-0430
Indianapolis, Indiana	317-638-8129
Kansas City, Missouri	816-221-3817
Las Vegas, Nevada	702-796-4877
Los Angeles, California	213-624-3730
Louisville, Kentucky	502-568-6250
Miami, Florida	305-262-9325
Minneapolis, Minnesota	612-339-1805
New Orleans, Louisiana	504-585-1120
New York, New York	212-766-2080
Newark, New Jersey	201-623-5666

Oklahoma City, Oklahoma	405-942-7278
Omaha, Nebraska	402-345-9557
Philadelphia, Pennsylvania	215-561-1634
Phoenix, Arizona	602-468-0285
Portland, Maine	207-775-6249
Portland, Oregon	503-274-6400
Providence, Rhode Island	401-435-1100
Raleigh, North Carolina	919-664-5848
Richmond, Virginia	804-287-8560
San Diego, California	619-467-9508
San Francisco, California	415-434-1580
Seattle, Washington	206-242-9992
Tucson, Arizona	520-571-0207
Washington, D.C.	202-547-0103



SUPPORT INFORMATION FOR THE TOP NOTEBOOK VENDORS

If something goes wrong, or if you're not sure about a certain feature, go to the source: the vendor that built the system. After all, the manufacturer knows your notebook's capabilities about as well as anyone.

Company	Customer information	Customer-information fax	Technical support	Technical-support fax	Technical-support hours (eastern time)	BBS number	Automated voice fax-back
Apple Computer Inc.	800-776-2333	None	800-767-2775	None	9:00-9:00 M-F	None	800-227-5329
AST Research Inc.	800-876-4278, 714-727-4141	None	800-876-4278, 714-727-4141	None	24 hours, 7 days	714-727-4723	800-926-1278
Compaq Computer Corp.	800-345-1518	713-378-1442	800-652-6672	713-378-0562	24 hours, 7 days	713-378-1418	800-345-1518
Dell Computer Corp.	800-613-3355, 512-338-4400	800-727-8320	800-624-9896	512-728-3589	24 hours, 7 days	512-728-8528	800-950-1329
Gateway 2000 Inc.	800-846-7072, 605-232-2000	805-232-2023	800-846-2000	605-232-2023	7:00 A.M.-1:00 A.M. M-F, 9:00-6:00 Sat.	805-232-2224	800-846-4526
IBM Personal Computer Co.	800-426-2968	404-238-1054	800-772-2227	404-238-1054	24 hours, 7 days	919-517-0001	800-426-4329
NEC Technologies Inc.	800-632-8377	None	800-388-8888	None	24 hours, 7 days	508-635-4706	800-388-0476
Tandy Corp.	817-390-3011	None	817-390-3011	None	9:30-6:30 M-F, 9:30-1:00 Sat.	None	None
Toshiba America Information Systems Inc., Computer Systems Division	800-334-3445	None	800-999-4273	None	24 hours, 7 days	714-837-4408	714-583-3800
Zenith Data Systems	800-533-0331, 708-808-5000	708-808-4434	800-227-3360, 708-808-5550	800-472-7211	24 hours, 7 days	708-808-2264	800-582-8194



TEN COMMON INTERNATIONAL DESTINATIONS

If you're traveling out of the country, it pays to plan ahead. Bring along modem and AC adapters and write down local access numbers for on-line services. Here's information for some common international destinations.

	AC power	RJ-11 phone jack	CompuServe	MCI Mail	America Online	AT&T Mail
Canada	120V, U.S. plug	Yes	Toronto, 416-367-8122	N/A	Ottawa, 613-235-6481	Toronto, 416-502-3000
France	220V, special plug	No	Paris, 1-4789-3940	Paris, 1-4342-1525	Paris, 1-4643-0505	Paris, 1-4344-2114
Germany	220V, special plug	No	Frankfurt, 069-20976	Berlin, 30-217-0662	Frankfurt, 69-666-9151	Berlin, 30-217-0662
Hong Kong	200V, special plug	Yes	3002-8332	852-827-4559	852-300-26442	852-300-34900
Italy	127V, 220V, special plug	No	Rome, 06-519-57347	Rome, 6-231-5728	Milan, 2-953-01301	Rome, 6-231-5728
Japan	100V, U.S. or special plug	Yes	Tokyo, 03-5471-4790	Tokyo, 3-3343-1196	Tokyo, 3-3794-6381	Tokyo, 3-5562-0146
Mexico	127V, U.S. plug	Yes	Mexico City 5-629-8101	Mexico City, 5-726-7600	Mexico City, 5-729-5200	Mexico City, 5-726-7600
South Korea	110V, 220V, U.S. or special plug	Yes	Seoul, 02-795-1002	Seoul, 2-795-1002	None	Seoul, 2-795-1002
Taiwan	110V, U.S. or special plug	No	Taipei, 2-395-5090	Taipei, 2-395-5101	Taipei, 2-851-8119	Taipei, 2-395-5101
United Kingdom	240V, special plug	No	London, 0171-490-8881	London, 171-434-3442	London, 171-973-1030	London, 171-418-0096

N/A—Not applicable. Access is provided through Datacube, type HELP PHONES <province> for a specific listing.
Note: Other local numbers may be available in different cities.

1. Follow instructions on the other side

Back

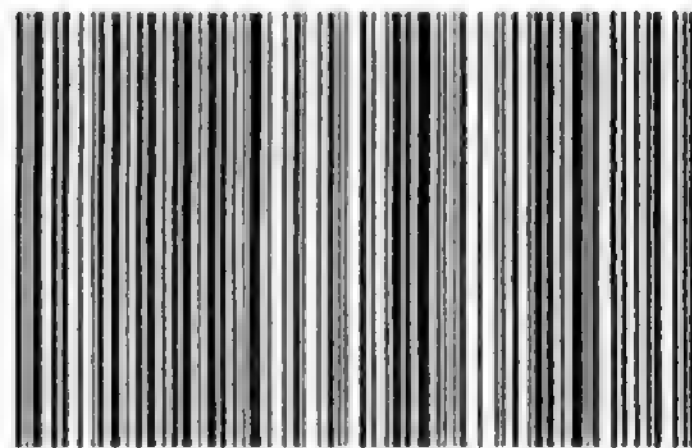
GB511PBack-001B



Inverted Back

1. Follow instructions on the other side

Folded edge of the page

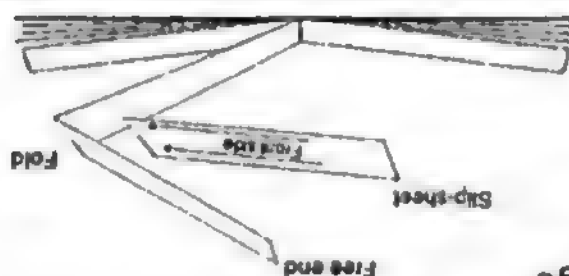
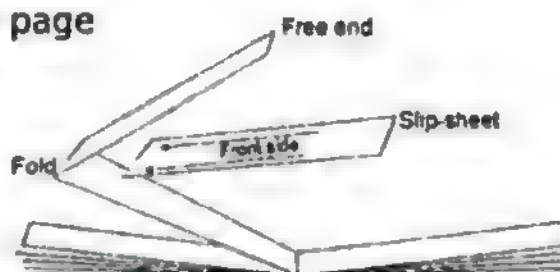


GbslipSheet-001

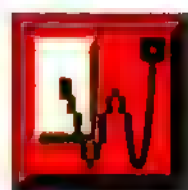
Inverted Foldout slip-sheet

Foldout slip-sheet

1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



1. Open the foldout page
2. Insert this sheet with
 1. Front side touching the free page
 2. Arrow pointing to the fold
3. Slice the folded edge
4. Close the page and slip-sheet



ON-LINE SERVICES

	Customer support (U.S. and Canada)	U.S. number for international customer support	Customer-support hours	Transmission parameters	Domestic access numbers	International access numbers
America Online	800-827-6364	703-448-8700 ¹	24 hours, 7 days	Handled by software.	To obtain a local number call 800-473-7983 (SprintNet) or 800-937-2862 (Tymnet), to 14,400 bps. 28,800-bps access is available in some areas.	Call 703-448-8700. ²
AT&T Interchange	800-299-9699	N/A*	10:00 A.M.—midnight, 7 days	Handled by software.	Handled by software, to 14,400 bps. Or check with SprintNet. 28,800-bps access is available in some areas.	None.
AT&T Mail	800-624-5672	201-331-4400 ¹	24 hours, 7 days	8 data bits, no parity, 1 stop bit. Flow control: at 9,600 bps or higher, XON/XOFF (through Access Plus).	800-624-5016, to 9,600 bps; 800-624-5123, to 2,400 bps.	Call 800-624-5672. ²
AT&T Personalink	800-400-5465	919-319-8196	8:00–8:00 M–F; 8:00–1:00 Sat.	Handled by software (access requires Sony's MagicLink or Motorola's Envoy).	800-543-3279 (embedded in the device), to 2,400 bps.	703-869-8553.
CheckFree	General queries: 614-825-3550; tech support: 614-825-3500	614-825-3550	8:00 A.M.—midnight M–F	Handled by software. (Terminal emulation: 8 data bits, no parity, 1 stop bit, hardware flow control.)	Use local CompuServe access numbers or call 800-263-7628 or 614-825-3500, to 14,400 bps.	Use CompuServe access numbers.
CompuServe	800-848-8990	614-529-1340 ¹	8:00 A.M.—midnight M–F; noon–10:00 P.M. Sat., Sun.	Handled by software. (Terminal emulation: 7 data bits, even parity, 1 stop bit, flow control: XON/XOFF or hardware.)	See the table "CompuServe Access" in this section.	See the table "CompuServe Access" in this section, or type GOPHONES on CompuServe.
GEie	800-638-9636	301-251-6475	9:00 A.M.—midnight M–F; 11:00–9:00 Sat., Sun.	Handled by software. (Terminal emulation: 8 bits, no parity, 1 stop bit, flow control: XON/XOFF, TTY terminal emulation.)	To obtain a local number, call 800-638-9636, to 14,400 bps through SprintNet.	Call 800-638-9636 for local numbers. (In countries with public data networks, check local phone books under Data Service Providers for local numbers.)
MCI Mail	800-444-6245	202-833-8484 ¹	24 hours, 7 days	8 data bits, no parity, 1 stop bit. Flow control: XON/XOFF, enabled in newer versions of the software. (These are domestic settings. They also apply internationally if the system is compatible with MCI's MEP2 protocol. Otherwise, 7 data bits, even parity, and 1 stop bit.)	800-456-6245 ² , to 14,400 bps; 202-467-6667 ³ , to 9,600 bps; Arlington, VA, 703-414-0750 ⁴ , to 2,400 bps; San Francisco, CA, 415-543-6364 ⁴ , to 2,400 bps.	Call 800-999-2096 or 908-885-2090. ²
Microsoft Network	General queries: 206-882-8080	N/A**	N/A**	Handled by software.	Handled by software (go through Setting), to 14,400 bps.	Handled by software.
Prodigy	800-776-3449	N/A*	24 hours, 7 days	Handled by software.	Handled by software (go through Setup to Dial the Phone Directory, a preset 800 number). Or call 800-776-3449, to 14,400 bps. 28,800-bps access is available in some areas.	N/A*.

¹ International local numbers are available. ² See the listing under "Ten Common International Destinations." ³ This number also applies to the U.S. Virgin Islands and Puerto Rico. ⁴ MNPS is available using this number. N/A*—Not applicable: The service is available only in the U.S. and Canada. N/A**—Not applicable: The service is not yet in operation.



NAVIGATING THE MODEM-COMMAND MAZE

If you must resort to terminal emulation to make your connection—or if you need to configure your comm software—here are some of the more common modem commands.

Command	Description	Command	Description
ATA	Answer the phone.	ATLx	Adjust volume. (L0 and L1, low; L2, medium; L3, high.)
ATDT	Dial using tone dialing.	ATX4	Wait for dial tone (modem recognizes busy signal).
ATDP	Dial using pulse dialing.	AT&Z=n	Store phone number n in memory slot x.
ATDS=x	Dial phone number n, which has been stored in memory.	, (comma)	Pause for 2 seconds.
ATH	Hang up the phone.	+++	Go to command state.
A/	Repeat last command (command does not begin with AT or end with <Enter>).	<Enter>	End command. (When on a line by itself, this command terminates dialing if the modem is dialing or waiting for a modem connection.)
ATS0=x	Answer after x rings.	Note: AT—attention—begins every command line except A/ and +++.	
ATS0=0	Turn off auto-answer.	Example: "ATDT 9,1-202-456-1414<Enter>" tone-dials to an outside line, pauses 2 seconds, then dials the White House. The modem ignores the space before the number and the hyphens within it.	
ATX0D	Blind-dial (force modem to dial without waiting for dial tone).	Example (to set up stored numbers): "AT&Z2=918001234567"	
ATZ	Reset.	Example (to call): "ATDS=2"	
ATMO	Shut speaker off. (M1, speaker is on until on-line; M2, speaker is always on; M3, speaker is on until on-line and off while dialing.)		

ROAD WARRIORS' TIP FILE

DISABLE CALL WAITING to avoid inadvertent disconnection while you're downloading. Dial *70 from most Touch-tone phones (1170 from rotary phones). If that fails, try #70, 70#, or 70*.

CARRY AN IN-LINE HANDSET COUPLER that lets you connect your modem to the handset jack on any phone. Not only will you avoid frying your PCMCIA modem on a digital PBX, you'll be able to plug in even if you can't get to the RJ-11 jack—or when you're in a country with phones that use incompatible plugs.

NEED TO PRINT? Keep common printer drivers—for the HP LaserJet II, HP LaserJet III, HP LaserJet 4, HP DeskJet 500, Epson LQ, and Apple LaserWriter—on your notebook so you can connect to whatever might be available in your hotel's business center, a branch office, or a quick-copy shop. In a pinch, you can use your fax software to "print" to a hotel's fax machine; it's expensive, but it works.

TRANSFER DATA FROM AIRPORTS and many hotel lobbies using an AT&T Public Phone 2000. The RJ-11 jacks do work—but you need to follow the directions to the letter, as ridiculous as they may seem. You'll need a calling card or major credit card, but there's no surcharge for data transmission.

TRANSFER DATA WHILE ALOFT using GTE's Airfone or AT&T's AirOne. Don't try to send large files, and don't expect to connect at anything

beyond 2,400 bps. Airfone costs \$1.50 for setup, plus \$1.50 per minute for domestic calls (voice calls cost more). AirOne costs \$2.50 for setup and \$2.50 per minute.

MAKING A CELLULAR CONNECTION? You'll need a modem that supports a cellular error-correcting protocol such as TxCel or MNP10, plus a cellular phone that's data-ready (on Motorola phones, look for the notation "MC2") and the appropriate adapter cable. Initialize your modem using the string "AT&F1*H0 S69=15 S70=20 W2". Then dial *3282 (for most cellular carriers) to connect to your service provider's modem bank. On a good day, you can manage 9,600 bps even while moving (although we don't recommend trying while you're in the driver's seat). Use "AT&F" to restore your modem's default configuration when you're finished.

GET THE LONG-DISTANCE CARRIER of your choice by dialing one of these six-digit prefixes before the ten-digit area code and phone number:

AT&T 102880 (10-ATT-0) **MCI** 102220 **Sprint** 103330

PROLONG YOUR BATTERY LIFE by enabling power management features on your notebook. Charge faster by turning your notebook off when it's plugged in. Take out PCMCIA modems.

IF YOU COMMUTE regularly with your notebook, buy a second AC transformer so you can keep one at home and one at the office. No more ducking under your desk to plug in.



SHOPPING FOR ROAD-WARRIOR GEAR

Here are some companies that specialize in outfitting road warriors.

Company	Products	Phone	Fax
Magellan's Catalog	International power and telephone/modem adapters	800-962-4943	805-568-5406
Mobile Planet Inc.	International power and telephone/modem adapters	800-675-2638, 818-888-9348	818-888-3484
TeleAdapt Inc.	International power and telephone/modem adapters	408-370-5105	408-370-5110
Unlimited Systems Inc.	Acoustic couplers (These attach to phone handsets so you can use a modem even if the phone lacks an RJ-11 jack—especially useful overseas.)	800-275-6354, 619-622-1400	619-550-7330

PLACE SETTINGS

Can't remember which bread plate or water glass is yours and which is your neighbor's? The bread plate is to your left and the water glass to your right. If you've got two wine glasses, the wider one is for red and the narrower one for white. Use utensils from



the outside in; your dessert utensils lie above the plate. And don't forget to keep your elbows off the table!



ROAD WARRIORS' LITTLE BLACK BOOK

AUTOMOBILE RENTALS

Company	Information
Alamo	800-327-9633
Avis	800-331-1212
Budget	800-527-0700
Dollar	800-800-4000
Enterprise	800-325-8007
Hertz	800-654-3131
National	800-328-4567

OVERNIGHT DELIVERY SERVICES

Company	Information	Your account #
Airborne Express	800-247-2676	
DHL	800-225-5345	
Federal Express	800-238-5355	
UPS	800-742-5877	

TRAVEL

Carrier	Domestic information	International information
Air France	—	800-237-2747
American	800-433-7300	800-624-6262
Amtrak	800-872-7245	—
ANA	—	800-235-9262
British Airways	—	800-247-9297
Cathay Pacific	—	800-233-2742
Continental	800-525-0280	800-231-0856
Delta	800-221-1212	800-241-4141
JAL	—	800-525-3663
Lufthansa	—	800-645-3880
Northwest	800-225-2525	800-447-4747
Qantas	—	800-227-4500
SAS	—	800-221-2350
Southwest	800-435-9792	—
TWA	800-221-2000	800-892-4141
United	800-241-6522	800-241-6522
USAir	800-428-4322	800-622-1015
Virgin Atlantic	—	800-862-8621

LODGINGS

Company	Information
Best Western	800-528-1234
Courtyard by Marriott	800-321-2211
Doubletree	800-222-8733
Embassy Suites	800-362-2779
Fairmont	800-527-4727
Four Seasons	800-332-3442
Hilton	800-445-8667
Holiday Inn	800-465-4329
Hyatt	800-233-1234
Inter-Continental	800-525-0280
ITT Sheraton	800-325-3535
Marriott	800-228-9290
Mendien	800-543-4300
Radisson	800-333-3333
Ramada	800-854-7854
Ritz-Carlton	800-241-3333
Stouffer	800-468-3571
Westin	800-228-3000

COOL PORTABLES



Gateway 2000's portable PCs—the Liberty and ColorBook!

GATEWAY 2000® LIBERTY™

- 4.2 Lbs., 10" x 8" x 1.6"
- 10.4" DSTN Color Display
- 1MB Video RAM
- Choice of Desktop IR Receptor or External Floppy Drive
- Intel® 486DX4 Processor
- Instant On
- Battery & AC Pack
- 2 PCMCIA Type II Slots
- EZ Point™ Integrated Pointer
- Removable Hard Drive
- 78-Key Keyboard
- Parallel, Serial, VGA & PS/2® Ports
- Portable Specific Software
- MS-DOS® 6.22, WFW 3.11 & Microsoft® Windows® 95
- MS Works for Windows 3.0 or MS Office Professional 4.3**

LIBERTY DX4-100 Base

10.4" DSTN Color Display, 8MB RAM, 340MB HD, MS Works 3.0

\$2999

LIBERTY DX4-100

10.4" DSTN Color Display, 16MB RAM, 540MB HD, 256K L2 Cache, MS Works 3.0

\$3749

LIBERTY DX4-100

Best Buy 48-Hour QuickShip*
10.4" DSTN Color Display, 24MB RAM, 720MB HD, 256K L2 Cache, TelePath™ 14.4 XJACK® Fax/Modem, Leather Carrying Case, Desktop IR Receptor, External Floppy Drive, MS Office Professional 4.3**

\$4499

COLORBOOK™

COLORBOOK² DX4-100

Deluxe

16MB RAM, 540MB HD, Port Replicator, MS Office Professional 4.3**

\$3499

COLORBOOK² DX4-100

Best Buy

24MB RAM, 720MB HD, TelePath 14.4 Fax/Modem, Carrying Case, External CD-ROM Drive, Port Replicator, MS Office Professional 4.3**

\$4499

Call for details on our portable PC options!

LIBERTY PROFESSIONAL PACK

MS Office Professional 4.3, PCMCIA TelePath XJACK 14.4 Fax/Modem, Extra Battery, Leather Carrying Case

\$449

*48-Hour QuickShip program applies only to the Liberty DX4-100 Best Buy configuration. Your PC will be delivered within two business days from the time of order. No additions or deletions can be made to the configuration. Available for approved credit card orders only while quantities last. Domestic U.S. orders only. Call us for details about other QuickShip offers.

**MS Office Professional 4.3 includes Word 6.0, Excel 5.0, PowerPoint® presentation graphics program 5.0, and Access® database 2.0.

SERVICE AND WARRANTY

- Lifetime portable-specific toll-free service and support
- One-year limited parts warranty
- 30-day money-back guarantee
- Special VIP warranty. We'll ship a replacement to you within 24 hours during warranty. Only available at the time of purchase for an additional \$100.

PAYMENT OPTIONS

- Gateway accepts most major credit cards and C.O.D. terms
- Net 30-day terms and leasing options available to qualified commercial customers
- You can also apply for the Gateway 2000 DuoLine™ MasterCard® card, issued by Dial National Bank, Des Moines, Iowa



Toll free from Canada
800-846-3609



Toll free from Puerto Rico
800-846-3613



8 0 0 - 8 4 6 - 7 5 6 3

610 Gateway Drive • P.O. Box 2000 • N. Sioux City, SD 57049-2000 • Phone 605-232-2000 • TDD 800-846-1778 • Fax 605-232-2023 • FaxBack 800-846-4526
Component Add-On Sales 800-846-2080 • Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CDT)

© 1995 Gateway 2000, Inc. Gateway 2000, black-and-white spot design, "G" logo and "You've got a friend in the business" slogan are registered trademarks, and ColorBook®, Liberty, EZ Point, and TelePath are trademarks of Gateway 2000, Inc. The Intel Inside Logo and Intel are registered trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping or applicable sales tax.

CLEAR-CUT ANSWERS

Your choice of a portable PC may not seem like a crystal clear decision at first. There are about a gazillion portables to choose from. Want some clear-cut answers to what's right for you?

Gateway 2000® offers quality portables with performance and features that'll thrill you to chills. But whether or not a Gateway Liberty™ or ColorBook™ portable PC is the right choice for you, look at these guidelines before choosing your portable PC.

Processor

You'll need a 486DX2 processor at the very minimum. Every Gateway 2000 portable PC includes a DX4 processor. A 486DX4 has the power to make your spreadsheets, graphics and word processing all run better and faster.

Cache

Cache is great — that is when you can find it on a portable — because it gives you a superior performance. Our Liberty DX4-100 includes 256K L2 cache on an accelerated local bus yielding Pentium®-like performance. The ColorBook™ includes 512K video cache for great video performance.

Hard Drive

Nothing less than a removable 340MB hard drive will do. In fact, you'll want the largest hard drive you can get. Microsoft® Windows®, DOS® and standard software applications automatically consume around 140MB at the time of purchase. And if you choose the Windows 95 operating system, it's about 160MB. All Liberty and ColorBook™ PCs include at least a 340MB removable hard drive that can be upgraded to a whopping 720MB.

RAM (Random Access Memory)

A bare *minimum* of 8MB RAM is best — 4MB wasn't enough last year. To adequately run Windows and Windows 95 you'll need 8MB. 8MB will also increase your battery life and improve system performance. All Liberty and ColorBook™ systems come standard with 8MB RAM and are expandable to 16MB or 24MB RAM.

Screen

When you're talking portables, you want the biggest, clearest display possible without adding weight or hiking up the price.

The 10.4-inch Liberty screen has an incomparable screen size-to-weight ratio of 2.44 giving you 23 percent more active viewing area than a 9.4-inch screen and 53 percent more than an 8.4-inch screen.

The Liberty's 10.4-inch and ColorBook's 10.3-inch screens give you the best value available in a color display. With vivid colors and bright, clear screens, you'll forget you're working on a portable PC.

Size and Weight

It's a portable PC — the smaller and the less it weighs, the better! The Liberty and ColorBook™ are leaders in these areas.

Batteries

Look for between three and four hours of battery life depending on the processor and RAM. Batteries based on nickel metal-hydride (NiMH) or lithium ion will give you the best performance. The Liberty gives you up to four hours or more with power management. And it also allows for upgrading to a lithium ion battery.

Software

Included top-selling software applications increase the value of your portable PC. Gateway pre-installs Microsoft Works for Windows 3.0 or MS Office Professional 4.3 on all Gateway portables, as well as OAG® FlightDisk® and World Clock software.

Keyboard & Pointing Device

You'll need a keyboard that's comfortable for you and that's also easy to use. The Liberty is equipped with a large palm rest, and flip-out feet so you can adjust the keyboard angle.

Pointing devices vary greatly. Again, find one that's easy for you to work with. Gateway's EZ Point™ integrated pointer is uniquely positioned to be comfortable and easily accessible.

Infrared Technology (IR)

Extras such as the Liberty's IR technology add even more value to your portable PC. With it you can take advantage of wireless file transfer — this means transferring files between the Liberty and your desktop (or between two Liberty PCs) without cables!

Service

Make sure you have the right support for your portable PC. Gateway 2000 has well-trained, dedicated portables and Windows 95 technical support technicians on call for the life of your Gateway system. We also offer a special VIP warranty.

Sights and Sounds of Tomorrow Coming Soon!

Portable computing with quality multimedia video and sound is in high demand in today's fast-paced mobile society. Soon Gateway 2000 will let you go Solo with these features!

Now that you have all the facts, go ahead and shop around. Then call one of our friendly sales representatives about the very cool Liberty and ColorBook™ portable PCs from Gateway 2000.



"You've got a friend in the business.™"

8 0 0 - 8 4 6 - 7 5 6 3



Compaq

F10

Pause
Break

Print
Screen
Sys. Req.

Insert

Delete

Backspace
Second Level

Enter

Shift



THE COLD HARD FACTS

GATEWAY2000



GATEWAY2000
LIBERTY

multimedia entries, posting above-average scores on all Windows-based tests. The Universa-CD even performed on a par with Pentium/75 systems in this roundup.

The system's CD-ROM drive is removable. Its bay can also accommodate a 3.5-inch floppy disk drive that can, with an included cable, be used externally at the same time as the CD-ROM drive. The notebook's hard disk is removable as well. There are two stacked PC Card Type II slots, and Aspen included a 14.4-Kbps PC Card fax modem (a \$195 option, included in the price listed above). The system also features a 16-bit audio subsystem with a microphone and two speakers.

Aspen Computer also offers two lines of Pentium-based notebooks, not reviewed here: the Universa-P and the Aspenta. Both of these lines include systems with 75- and 90-MHz Pentiums; the Universa-P line also has a Pentium/100 unit. The Aspenta line has both PCI and VL-Bus architectures available. Aspen includes a one-year-parts, two-years-labor warranty with the Universa-CD.—William P. Flanagan

Aspen Computer Inc., Buffalo, NY; 800-472-3273, 716-626-0315; fax, 716-626-1541.

Circle 454 on reader service card

AST Research Inc.

Ascentia 950N

Ascentia 910N

AST Research's \$5,498 Ascentia 950N and its \$4,448 Ascentia 910N proved to be a mixed bag in terms of features and performance. The full-featured Pentium/75-based 950N includes a screen capable of 800-by-600 resolution, but it wasn't a standout performer. The value-priced DX4/75-based 910N was a weak performer but had a long battery life. Both units can be used with AST's \$489 docking station, PowerStation III.

The 950N is marketed as a "no-

SUITABILITY TO TASK
Ascentia 950N

Desktop replacement	Excellent
Road warrior	Excellent

SUITABILITY TO TASK
Ascentia 910N

Desktop replacement	Fair
Road warrior	Excellent

256K of L2 cache. Though we received the unit with a 503MB hard disk, it is now available only with an 810MB hard disk (same price).

The 950N's 10.5-inch active-matrix display provided sharp images in Windows, but in DOS, text had a jagged appearance. The reason is simple: This panel can handle Super VGA resolution, and the unit is stretching DOS text to fit that instead of using a different font (it's the only Super VGA system here to do so).

The 950N's performance was generally competitive. Its Winstone 95 score was average and its Graphics WinMark 95 score was above average, but its Disk WinMark 95 score was below average. The 950N was running Microsoft Windows 3.1 and could not keep up with units running Microsoft Windows for Workgroups. The 950N, using a lithium ion battery, posted a WinDrain score of 2:24.

The 910N is marketed as an affordable yet powerful portable; it has a 10.5-inch active-matrix display with a maximum resolution of 640-by-480. The 910N replaces AST's now-discontinued Ascentia 810N line of value notebooks.

The 910N posted below-average Winstone and Graphics WinMark scores. Like the 950N, it was running Windows 3.1, and turned in the lowest Disk WinMark score in this entire roundup by a wide

margin. The only bright spot in the 910N's test results was its battery life: At 3:40, it was second-best of all systems reviewed, thanks to a lithium ion battery.

The PowerStation III dock offers the standard I/O ports as well as two ISA slots and room for two 5.25-inch devices.

AST backs its Ascentias with a three-year parts-and-labor warranty. One year of ExeCare Plus, which provides for 48-hour repair turnaround and express delivery return, is also included.—RSA

AST Research Inc., Irvine, CA; 800-876-4278, 714-727-4141.

Circle 455 on reader service card

Astro Research Inc.

AstroNote SKD III

Astro Research's \$2,795 DX4/100-based AstroNote SKD III is a versatile full-featured notebook in terms of expandability. Its performance, however, leaves room for improvement.

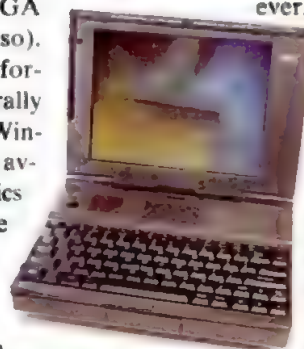
Astro Research aims the modular SKD III, which features a 9.5-inch active-matrix LCD, at power users who need flexibility. The company recently released the AstroNote PMD II (not reviewed), which has a removable CD-ROM drive and an upgradable 9.5-, 10.4-, or 11.3-inch display.

There's not much you can't remove from the SKD III. Its floppy disk drive can be swapped for a second battery (\$145); its PC Card slot module can be replaced with a SCSI, Ethernet, serial, or fax-modem module; and its socketed CPU can be upgraded.

Just below the unit's removable 503MB hard disk are three audio connectors and a port for an external CD-ROM drive. The sound from two bottom-mounted speakers is adequate but is easily muffled.

The SKD III's pointing stick and tiny mouse buttons seem to favor left-handed users. The pointing stick is embedded in the right side of the Spacebar, making it hard for right-handed users to reach the right mouse button with the same hand.

The SKD III was a disappointing performer. Its Graphics WinMark 95 score



AST Ascentia 950N.

SUITABILITY TO TASK
AstroNote SKD III

Desktop replacement	Fair
Road warrior	Fair

CONSERVE CASH.



Introducing the New Satellite® Notebooks.



The new Satellite® with Toshiba's Turbo 75 technology lets you enjoy premium performance — without paying a premium price. The new Satellite® notebooks combine a powerful 75MHz Intel DX4™ processor with speed-enhancing and power-efficient features like fast-page RAM access, local-bus video and graphics acceleration. The result? Blistering system performance that can

Satellite®

T2130CT*:

- 10.4" dia. color TFT-LCD active matrix display
- 520 Million Bytes (=500MB) HDD
- 8MB of RAM expandable to 32MB

T2130CS*:

- 10.4" dia. color dual-scan STN display
- 520 Million Bytes (=500MB) HDD
- 8MB of RAM expandable to 32MB

T2110CS*:

- 10.4" dia. color dual-scan STN display
- 350 Million Bytes (=330MB) HDD
- 4MB of RAM expandable to 28MB

ALL MODELS:

- 75MHz Intel DX4™ processor
- Integrated math coprocessor
- 16KB cache
- Two stacked PC Card slots (two Type II or one Type III)
- Plug and Play connectivity
- NiMH battery with Toshiba MaxTime® Power Management
- Built-in power supply

- AccuPoint™ integrated pointing device
- 3.5" floppy disk drive
- Under 7 lbs.
- Optional Port Replicator
- Pre-installed software: DOS, Microsoft® Windows® and Fn-esse™
- 1 yr. limited warranty



SPLURGE ON POWER.



Optional
Port Replicator

outperform 100MHz systems while optimizing precious battery life. But that's just the beginning.

You also get a big 10.4" diagonal color display, a built-in power supply so there's no bulky external AC adapter, an AccuPoint™ integrated pointing device, Plug and Play expansion, rugged construction and more.



Call 1-800-457-7777 for your nearest dealer.

In Touch with Tomorrow
TOSHIBA

Toshiba. The World's Best Selling Portable Computers.

†T2110CS. Reseller prices may vary. All prices and specifications are subject to change. *The T2130CT, T2130CS and T2110CS are sold at selected retailers as the T2135CT, T2135CS and T2115CS with additional pre-installed software.
© 1995 Toshiba America Information Systems, Inc. All products indicated by trademark symbols are trademarked and/or registered by their respective companies. The Intel Inside logo is a trademark of Intel Corporation.
CIRCLE 379 ON READER SERVICE CARD

IT'S NOT IF. IT'S WHEN.

486, Pentium, PowerMac... No matter how fast your PC is, it can't outrun a power problem (Get Uninterruptible...starting at \$119)

Just don't have the time for power problems on your PC? Don't worry. They'll always make the time for you. It's not if a power problem will occur, but when. Due to household appliances, poor wiring, bad weather or even other office equipment, power problems are as inevitable as death and taxes.

IN THE NEXT THREE MONTHS, MORE THAN 30,000,000 PCs WILL BE HIT BY POWER PROBLEMS...

In fact, you have better odds of winning the lottery than of escaping the sting of power problems on your PC. One study discovered a typical PC is hit over 100 times a month, causing keyboard lockups, hard drive damage, and worse. And since sags and blackouts represent more than 85% of power problems likely to hit your computer, standard surge suppressors are literally power-

APC UNINTERRUPTIBLE POWER MEANS SAFE DATA, HAPPY COMPUTERS

Sealed no-maintenance internal battery provides instant power in event of sag or blackout, protecting your data from loss

Surge protection backed by up to a \$25,000 insurance policy protects valuable computer hardware from loss

Filters remove electromagnetic interference

Site wiring fault indicators automatically diagnose dangerous wiring conditions

Audible and visual alarms alert you to power problems

Signals your computer, saves your data (APC software required)

Raw AC

Safe AC



APC Uninterruptible Power Supplies provide instant battery backup to protect your data from loss and your hard drive from damage. Units are even backed by up to \$25,000 in lifetime surge protection insurance.

less to protect you. And a study in a recent PCWeek showed that the largest single cause of data loss is bad power, accounting for almost as much data loss as all other causes combined.

PROTECT YOURSELF BEFORE YOU KICK YOURSELF...

Get instantaneous battery backup power from an APC Uninterruptible Power Supply and prevent keyboard lockups, data loss, and hard disk crashes. Surge protection performance is even backed by up to a \$25,000 Lifetime Equipment Protection Guarantee.



Ask for APC at your computer reseller today or call for your FREE handbook. Starting at just \$119, an APC UPS is serious protection no serious computer users should be without.



"Don't take chances...get the ultimate protection... from APC." --PCWorld



Visit APC's NEW PowerPage™ on the Internet www.apcc.com

OVER 3,000,000 SATISFIED APC USERS...

"This is the best computer related purchase I have ever made! Has saved me hours of re-programming..."
Carol Irvine, Wizard Assoc.

"We reduced our maintenance costs the first year by 50% in repairs of equipment."
Valentin Gonzalez, Pfizer

"Our server was running a project when it lost power... messed up all the data files. It took four days to recover. But we don't worry anymore since we got APC..."
Tony Chen, DeAnza Systems

"We were working on a state bid when the power went off. APC saved the day and year and future... about 800 pages of data saved thanks to APC."
Ravi Iyer, Software Galleria

"A power surge did significant damage to all of our systems except those protected by APC. The APC units were undamaged..."
C. Jeffrey, C. Jeffrey Eng.

"APC has virtually eliminated downtime in our corporate network..."
Kurt Roemer, Searle Corp.

"Power went out while processing payroll! If not for APC we would have had a walkout!"
Suzi Higgason, OSI Inc



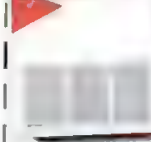
Home office user Don Traux knows first hand about APC reliability. "It ought to be against the law to buy a computer without an APC Back-UPS 250. I recently had a direct lightning hit right outside the house... my computer never blinked."

"APC lets me sleep better at night. How much would you pay to get back that one file you worked all day to complete for the boss who gets on the plane at 8:00 a.m.? You should assume that you'll buy a UPS, not that it's some luxury item."
R. Morella

"A power surge wiped out the FAT tables on all PC's not protected by APC. Now have APC installed on all..."
Craig Post, Comm. Tech.

"Before I purchased the UPS I had to put in at least two hard drives at \$1000. With APC products... no new hard drives in two years!"
S. Foreman, LSP

Solutions '94



FREE 60-PAGE HANDBOOK

What are the causes and effects of power problems? The most common power protection mistakes? Call for your free handbook today! Please reference Dept E4.

APC
AMERICAN POWER CONVERSION

800-800-4APC

401-788-2797 fax / 800-347-FAXX
132 Fairgrounds Rd., W. Kingston RI 02892 USA
A publicly-traded company (NASDAQ: APCC)

CIRCLE 162 ON READER SERVICE CARD



was the lowest among full-featured machines. This poor showing can be attributed in part to its Chips & Technologies 65540 graphics chip set; the top scorers on this test used C&T's newer 65545 chip set. Also, the unit's ACC Micro Electronics motherboard chip set does not handle main-memory reads and writes as efficiently as chip sets used by other systems in this roundup. The unit's Winstone 95 score was the second-lowest in its class, and its Disk WinMark 95 score was average. On our WinDrain battery test, the unit lasted only 1:37.

Astro Research backs its units with a one-year parts-and-labor warranty.—*RSA Astro Research Inc., Monterey Park, CA; 800-367-6683, 818-293-1651; fax, 818-293-1655.*

Circle 456 on reader service card

AT&T Global Information Solutions

Globalyst 250P Globalyst 200S Globalyst 130

AT&T's notebooks are an eclectic collection. Not only do they have vastly different feature sets, but they are visually dissimilar as well. Three separate vendors manufacture the \$2,221 Globalyst 130 subnotebook, the \$3,455 Globalyst 200S value notebook, and the \$7,280 Globalyst 250P full-featured notebook (all street prices), though the first two are designed by AT&T. All three have two stacked Type II PC Card slots and a trackball—but that's where the similarities end.

A robust desktop replacement, the 250P is a notebook with an 8.3-pound travel weight and a Pen-

tium/75 CPU, 256K of L2 cache, 20MB of RAM, and a 772MB hard disk. A 10.5-inch, 800-by-600 active-matrix display produces excellent graphics. A variety of optional peripherals round out the package—among them, the \$105 Cable Manager port replicator and the \$955 MediaDock, a multimedia docking station with CD-ROM drive. The 250P posted above-average scores on our Winstone 95 and Graphics WinMark 95 tests; its Disk WinMark 95 score was average. The 250P also did well on our WinDrain battery test, lasting for just over 2 hours.

The 130 subnotebook earns mixed reviews. With a travel weight of 5.1 pounds, a case that is only slightly larger than a hardback novel (2 by 10.5 by 8 inches), and a compact AC adapter, it is easy to transport, and its 2-hour battery life is about average for a subnotebook. Of the subnotebooks tested, however, this DX4/75 machine received the lowest Winstone score. Part of the reason: the Chips & Technologies 65535 graphics chip set, which couldn't keep up with the newer C&T 65545 chip set found in other units. The 130 features a 10.4-inch dual-scan display.

The 200S is appealing as a value-priced desktop replacement. With a DX4/75 CPU, 12MB of RAM, and a 335MB hard disk, the 200S delivered above-average Winstone and Disk WinMark scores, and an average Graphics WinMark score among value notebooks. On our WinDrain battery test, the unit ran for 2:06.

Standout features on the 200S include a 10.4-inch dual-scan display, a full-size keyboard, two stereo speakers, and a connection to one of two optional port replicators. Both the \$95 QuickDock II and the \$225 PowerDock II provide standard external connections, while the PowerDock II adds a Type III PC Card slot and an internal AC adapter to power and charge your notebook while docked.

These systems come with AT&T Mail Access Plus, AT&T Vistium Share Software, and Starfish Software's Sidekick for Windows. The 200S and 250P are supported by a three-year warranty; the 130 has a one-year warranty.—*Cade Metz*

AT&T Global Information Solutions, Dayton, OH; 800-447-1124, 513-445-5000.

Circle 457 on reader service card

Austin Direct

Vista Notebook StepLite Notebook

In our last notebook roundup, Austin Direct's Business Audio DX4/100 was an impressive performer. The company's new, larger machines—the \$2,344 StepLite subnotebook and the \$3,319 Vista value notebook—stand out for their aggressive pricing. In terms of performance, the Vista was competitive in its category, but the StepLite was not.

According to Austin, the DX4/100-based Vista is geared as a desktop replacement and toward the businessperson who makes frequent out-of-office presentations. The unit addresses this market with its most prominent feature, an 11.3-inch dual-scan display—one of only three screens in this roundup larger than 11 inches.

While this display's size would be a plus during a presentation, the dual-scan panel is typical in that it is difficult to view from an angle. To accommodate this screen, the Vista's footprint is slightly larger than that of the average notebook.

The Vista also features a pointing stick and a keyboard that is set at the back of the unit, leaving plenty of room for the heels of your hands. The total package is comparatively light given its components, weighing in at 7.6 pounds (travel weight). If not for a 1:47 battery life, the Vista would be an admirable road warrior.

This system was a good performer: It produced an above-average Disk Win-

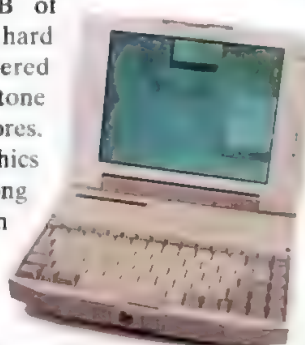
SERVICE & RELIABILITY

AT&T GIS

Reliability	Average
Repair	Average
Technical support	Average
% needing repair	Average



AstroNote SKD III



AT&T Globalyst 250P

SUITABILITY TO TASK

Globalyst 250P

Desktop replacement	Good
Road warrior	Good

SUITABILITY TO TASK

Globalyst 200S

Desktop replacement	Fair
Road warrior	Fair

SUITABILITY TO TASK

Globalyst 130

Desktop replacement	Fair
Road warrior	Good

SUITABILITY TO TASK

Vista Notebook

Desktop replacement Good

Road warrior Good

SUITABILITY TO TASK

StepLite Notebook

Desktop replacement Poor

Road warrior Good

Mark 95 score and average Winstone 95 and Graphics WinMark 95 scores for the value category. A line-in, speaker, and microphone jack; two stereo speakers; and a bundled copy of Microsoft Office (also included with the Step-

Lite) make this an adequate presentation machine. Austin's StepLite is a functional road warrior, combining a 9.5-inch dual-scan display, a small frame (1.5 by 10.5 by 7.8 inches), and a travel weight of 5.7 pounds with a 2:18 battery life. By August, the StepLite should also include 16-bit sound and an IrDA-compliant interface.

The StepLite's performance is not as attractive. This 486DX2/50-based machine was one of only two subnotebooks in our roundup with 8MB of RAM, and it finished last among its competitors on our Winstone tests. Its Graphics WinMark score was also considerably lower than its group's average. Its Disk WinMark score was average.

SERVICE & RELIABILITY

Austin Direct

Reliability Average

Repair Average

Technical support Average

% needing repair Worse than average

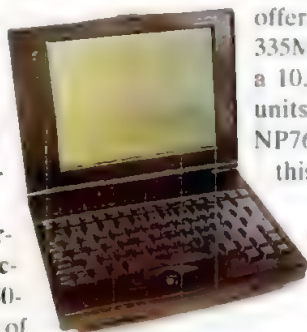
turn it off. Austin chose this design as a space-saving measure.

Austin Direct is a division of IPC Technologies. The company provides 24-hour, seven-day support and one-year warranties for both machines.—CM

Austin Direct, Austin, TX; 800-483-9938, 512-339-3500; fax, 512-454-1357.

Circle 458 on reader service card

Lite) make this an adequate presentation machine.



Austin StepLite Notebook.

Perhaps the most puzzling feature of the StepLite is its lack of a power button. You must use the Spacebar to turn the machine on and a function key to

Broadax Systems Inc.

BSI NP7659T

BSI NP7657D

BSI NP9549D

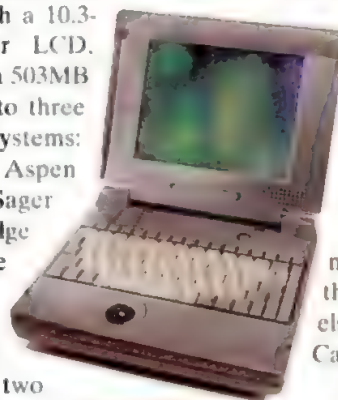
Broadax Systems hits good price points with its \$3,780 full-featured BSI NP7659T, the \$2,580 multimedia BSI NP9549D, and the \$2,295 BSI NP7657D, a value system. All three also performed well on most tests, although the full-featured and value units produced below-average WinDrain scores.

The BSI NP7659T and the BSI NP7657D use the same case. The former is equipped with a 90-MHz Pentium CPU, a 772MB hard disk, 16MB of RAM, and a 9.5-inch active-color LCD; the latter offers a 75-MHz Pentium CPU, a 335MB hard disk, 8MB of RAM, and a 10.3-inch dual-scan LCD. These units are similar to the Sager NP7659T (reviewed elsewhere in this issue).

The BSI NP7659T and BSI NP7657D offer a trackball embedded in a large palm rest and a 16-bit audio subsystem with two clear-sounding speakers. The large \$465 docking station for these two units offers two speakers, two drive bays, four expansion slots (an even mix of ISA and VL-Bus), and a SCSI port in addition to the standard I/O ports.

The DX4/100-based BSI NP9549D multimedia notebook has a built-in CD-ROM drive, which can be swapped for a floppy disk drive. When the CD-ROM module is installed, you can still use the floppy disk drive externally by connecting it to the system with a cable. The unit, which came with a 10.3-inch dual-scan color LCD, 16MB of RAM, and a 503MB hard disk, is similar to three other reviewed systems: Aspen Computer's Aspen Universa-CD, the Sager NP9549A, and Wedge Technology's Wedge ShowBIZ.

The BSI NP9549D offers a 16-bit audio subsystem but its two speakers are in the palm rest, **BSI NP7659T.**



where they're easily muffled by your hands. A loud fan limits the fidelity of a built-in microphone. The unit's travel weight with the CD-ROM module installed is 9 pounds.

The BSI NP7659T performed extremely well in the full-featured group, posting above-average scores on all Windows-based tests. Among the multimedia units, the BSI NP9549D posted above-average Disk WinMark 95 and Graphics WinMark 95 scores. Its Winstone 95 score was average.

The performance of the BSI NP7657D was good compared with its competition in the value class. This system posted Disk WinMark and Graphics WinMark scores well in excess of group averages. Its Winstone score was above average as well.

Broadax offers a one-year parts-and-labor warranty with these systems.—RSA

Broadax Systems Inc., El Monte, CA; 800-872-4547, 818-442-0020; fax, 818-442-4527.

Circle 459 on reader service card

Canon Computer Systems Inc.

Innova Book 200LS IB100/520LS

Canon's Innova Book 200LS—which sells for about \$3,599 list and \$3,199 street—will immediately catch your eye with its 11.3-inch dual-scan color display. This DX4/100-based machine is a solid value-class performer and also packs many features found in notebooks in this roundup's full-featured category, making it well worth a second look.

A system similar to the Innova is sold by Austin Direct as the Vista Notebook (reviewed elsewhere in this roundup). Canon also sells the Innova Book 150C series for entry-level users. That unit has a

SUITABILITY TO TASK

BSI NP7659T

Desktop replacement Good

Road warrior Poor

SUITABILITY TO TASK

BSI NP7657D

Desktop replacement Good

Road warrior Fair

SUITABILITY TO TASK

BSI NP9549D

Desktop replacement Good

Road warrior Fair

*How Do You Tell If
It's A "TRINITRON"?*



486DX2/66 CPU and a 9.5-inch display.

The Innova's case is slightly wider than that of most notebooks reviewed to accommodate its display (this panel can handle up to 65,536 colors), but you won't find extra heft. The unit's travel weight is 7.5 pounds, average for its category.

Despite its moderate price, the Innova includes more than you might expect in a value notebook. It has built-in 16-bit stereo sound, two speakers, and a full-size keyboard. Upgrades are a snap: Memory is easily accessible, and its 501MB hard disk slides right out easily. The case has prop-up legs in the back so you can tilt the unit for more comfortable typing. The system has one Type III PC Card slot, and Canon will offer a port replicator by the time you read this.

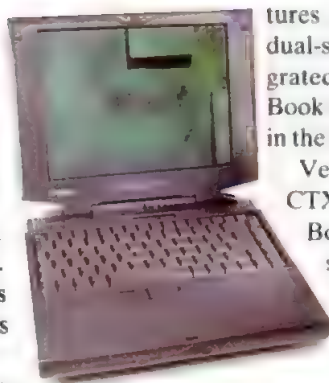
The Innova was a good performer for the most part, with average Winstone 95 and Graphics WinMark 95 scores. Its Disk WinMark 95 score was below average, caused in part by a low CPUmark₁₆

score. The unit's nickel hydride battery yielded a Win-Drain time of just under 2 hours.

Canon offers a one-year warranty with the system. The company also has a one-year replacement policy. If your notebook breaks within this one-year period, Canon will send you a new system within 24 hours.—Anush Yeghazarian

Canon Computer Systems Inc., Costa Mesa, CA; 800-848-4123, 714-438-3000; fax, 714-438-3317.

Circle 460 on reader service card



**Canon Innova Book 200LS
16100/520LS.**

tures a bright 10.5-inch Sharp dual-scan display and has integrated 16-bit sound. But the EzBook falls short of its competition in the performance arena.

Veridata, a sister company of CTX, manufactures the EzBook. This machine is also sold by MPC Technologies as the MPC TouchNote (reviewed elsewhere in this roundup). As tested, the TouchNote is \$400 less than the EzBook—but the TouchNote's hard disk is smaller.

The EzBook uses a smart nickel hydride battery, although you must remove the battery from the system to reach the button and see the LEDs. On our WinDrain battery test, the EzBook posted a competitive running time of 2:46.

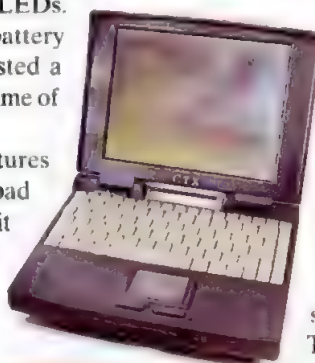
The EzBook features an EzGlide touchpad and built-in 16-bit audio that supports FM synthesis. The unit also integrates a microphone and one speaker. It has the usual complement of full-size ports and includes a docking-station connector (a CD-ROM-equipped docking station is available for \$799). What the unit doesn't have is separate keyboard and video-out ports: You must use the included Y adapter.

The EzBook was a poor performer on our tests. Equipped with Microsoft Windows 3.11, it was overshadowed on our Disk WinMark 95 and Winstone 95 tests by other units running Microsoft Windows for Workgroups. Its Graphics WinMark 95 score was also below average.

CTX includes a two-year parts-and-labor warranty (the battery is covered for one year). By fall, CTX expects to be selling notebooks with Pentium CPUs and built-in CD-ROM drives.—Carol Venezia

CTX International, Walnut, CA; 800-888-2017, 909-595-6146; fax, 909-595-6293.

Circle 461 on reader service card



CTX EzBook.

Dell Computer Corp.

Latitude XP4100CX Latitude 475C

The \$2,298 Latitude 475C and the \$4,897 Latitude XP4100CX represent the value and full-featured notebook offerings, respectively, from Dell. The XP4100CX is geared to users seeking to maximize performance, while the 475C is aimed at performance-oriented users who are more cost-conscious. Both machines have travel weights under 7 pounds.

The 475C incorporates a 9.5-inch dual-scan display and nickel hydride battery pack to help keep costs reasonable. The XP4100CX has higher aspirations, offering a 9.5-inch active-matrix screen and lithium ion battery pack, plus more system memory expandability and an optional port replicator.

Both units included a 14.4-Kbps PC Card fax modem. The hard disk on the XP4100CX is also larger than that of the 475C—772MB rather than 325MB—and its DX4 processor runs at 100 rather than 75 MHz.

Where the XP4100CX falls short is in terms of performance. The unit turned in below-average scores for its class on both our Winstone 95 and Graphics WinMark 95 tests, garnering an average score only on our Disk WinMark 95 tests. The cause of the XP4100CX's poor performance was that its core-logic chip set was fooled into powering-down the processor (to extend the system's battery life) more frequently than necessary.

Though this should contribute to impressive battery life under real-world conditions, in actuality, top speed is sacrificed. The 475C posted average scores on all our Windows-based tests within the value category, except for a below-average Winstone score.

SUITABILITY TO TASK

Innova Book 200LS

Desktop Replacement	Good
Road warrior	Good

SUITABILITY TO TASK

Latitude XP4100CX

Desktop replacement	Fair
Road warrior	Good

SUITABILITY TO TASK

Latitude 475C

Desktop replacement	Poor
Road warrior	Good

SERVICE & RELIABILITY

Dell Computer Corp.

Reliability	Average
Repair	Average
Technical support	Average
% needing repair	Average

CTX International

EzBook

CTX International, best known for monitors, positions the EzBook as a value notebook for those who also want a full complement of features. For the most part, the EzBook lives up to this promise. The DX4/75-based system, with a competitive street price of \$2,549, fea-

SUITABILITY TO TASK

EzBook

Desktop Replacement	Fair
Road warrior	Good

BY THE PICTURE ON THE SCREEN.

Multiscan 20se



The best monitors have something distinctly different. The Trinitron[®] Inspiring Vision Logo.

Monitors with this logo have state-of-the-art Trinitron technology inside, including a vertically-flat screen that minimizes image distortion and light reflections from corner-to-corner. And the revolutionary Aperture Grill. It virtually eliminates the doming and scan-moire effect. Together, the Aperture Grill and unique electron gun system provide you with a crisper, clearer, sharper, brighter picture.

For the highest quality, look for the Trinitron Inspiring Vision Logo. Then you'll know it's really a Trinitron monitor.

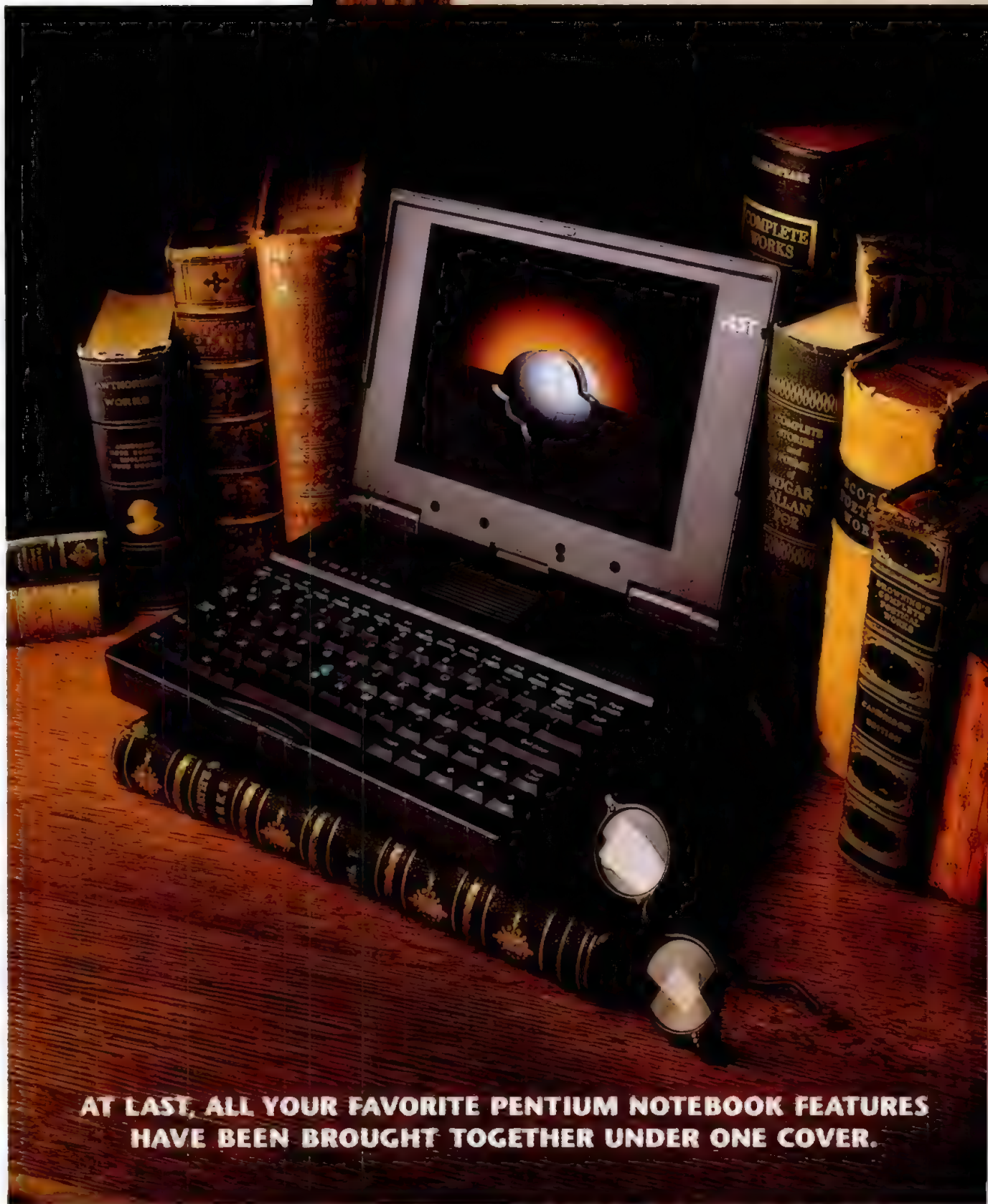
SONY

© 1985 Sony Electronics Inc. Reproduction without written permission is prohibited. Sony, Trinitron, and the Inspiring Vision/Trinitron logo are trademarks of Sony.

CIRCLE 071 ON READER SERVICE CARD

You've seen Pentium® notebooks with this feature. Or that feature. But everything? Well, complete only begins to describe the Ascentia™ 950N.

First, there's the 75 MHz Intel® Pentium processor. It's all



**AT LAST, ALL YOUR FAVORITE PENTIUM NOTEBOOK FEATURES
HAVE BEEN BROUGHT TOGETHER UNDER ONE COVER.**

the power you need to run the most demanding software. Some notebooks are great for memos. This one is capable of something more on the scale of *War and Peace*.

There's also a 10.4" Super VGA 800 x 600 resolution screen,

in active-matrix TFT or dual-scan STN. You'll see 56% more of your document, which cuts down on panning and scrolling. In other words, you'll get the complete picture.

Your projects will sound better, too, with 16-bit Sound Blaster® features and an embedded speaker and microphone. So you can easily take a track off that new CD and drop in a video clip for impressive multimedia presentations.

And since we wouldn't want to interrupt the flow of the next great American novel or the quarterly sales report, there's a long-lasting Lithium Ion battery. Infrared technology for wireless printing and transferring of files? Got that, too.

Even the 3-year worldwide warranty* comes with round-the-clock telephone support and our ExeCare™ 48-hour rapid repair service.**



THE COMPLETE PENTIUM NOTEBOOK

Processor:
75 MHz Pentium,
256 KB Level 2 Cache

Multimedia:
Sound Blaster 16-bit
sound system

RAM:
8 MB expandable
to 40 MB

Hard Drives:
500 MB, 800 MB
or 1.2 GB

Screen:
10.4" (Diagonal)
Super VGA 800 x 600
active-matrix TFT or
dual-scan STN

Battery:
Lithium Ion, for up
to 4 hours

Weight:
6.2 pounds

For more information on the Ascentia 950N's abundant features and a reseller near you, call 800-876-4AST. We can even fax back the information. Yes, we've thought of everything.

AST
COMPUTER

© 1995 AST Research, Inc. AST is a registered trademark of AST Research, Inc. AST Computer, the AST logo and Ascentia are trademarks of AST Research, Inc. ExeCare is a service mark of AST Research, Inc. Intel, Intel Inside and Pentium are registered trademarks of Intel Corporation. Sound Blaster is a registered trademark of Creative Technology Limited. *Limited warranty service in over 80 countries outside the U.S. on a courier basis to the nearest AST authorized service provider. **For one year in U.S. only.

CIRCLE 122 ON READER SERVICE CARD

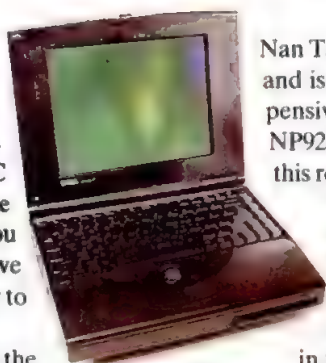
COVER STORY
Color Notebooks

The smart lithium ion battery in the XP4100CX paid off on our WinDrain test, yielding nearly 3 hours of battery life. The 475C managed 2:07, a respectable result. The 475C also lets you swap out the floppy disk drive and insert a second battery to increase battery life.

Both Dell units include the Dell Assistant, a group of programs that helps you identify your configuration, handle power management, and do software backups. You also get on-line materials, including manuals and answers to frequently asked questions.

Dell offers a three-year warranty on the XP4100CX, which includes one year of on-site service and next-business-day replacement service. The 475C has a one-year warranty (although no on-site service is available), with one-year, next-business-day replacement service available for \$149.—AY

Dell Computer Corp., Austin, TX; 800-613-3355, 512-338-4400; fax, 800-727-8320.
Circle 462 on reader service card



**Dell Latitude
XP4100CX**

Nan Tan Computer Co. of Taiwan and is similar to but far more expensive than the Micro Express NP92DX4, reviewed elsewhere in this roundup.

The unit integrates 8-bit sound and a microphone. It has no internal modem but its 14.4-Kbps PC Card data/fax modem (included in the above price) can do the trick. The MediaBook has a Type III slot stacked with a Type II slot so you can use both

types of cards simultaneously. The hard disk is also easily removable.

DFI offers both a docking station and a port replicator for the MediaBook. Its 14.6-pound \$495 dock features a 5.25-inch external drive bay (occupied by a SCSI quad-speed CD-ROM drive, an additional \$399), and four expansion slots (two VL-Bus and two ISA). The \$99 port replicator duplicates all system ports and adds a serial and an AT-bus port.

The MediaBook uses two nickel hydride batteries, which together lasted just over 2 hours on our WinDrain test. Since there are two, you can hot-swap one at a time. The unit does not let you charge the batteries while the system is in use.

Despite 128K of L2 cache, the MediaBook did not perform well on our tests. Its Winstone 95, Disk WinMark 95, and Graphics WinMark 95 scores were all below average for full-featured notebooks.

DFI backs the MediaBook with a one-year parts-and-labor warranty; on-site service is available for \$90 per year.—AY
DFI Inc., Sacramento, CA; 800-808-4334, 916-568-1234; fax, 916-568-1233.

Circle 463 on reader service card

Digital Equipment Corp.

HiNote CT475 HiNote Ultra CT475

Digital's DX4/75-based systems, the \$3,539 HiNote CT475 value notebook and the \$4,999 HiNote Ultra CT475 subnotebook, are both strong machines. Few products in this roundup can match them in terms of either design or

performance. Digital currently offers no other notebook lines, although dual-scan versions of each of these products are available for about \$1,500 less. These machines are both designed by Digital and manufactured by Citizen.

Though the HiNote Ultra is slim and has a scant travel weight of 4.8 pounds, it doesn't skimp on features. Its bright 9.5-inch active-matrix screen is set by Digital at 256 colors, but users can set the screen to 32,768 or 65,536 colors. The system also features 16-bit sound and an infrared transceiver. It comes with a wedge-shaped external floppy disk drive that fits neatly beneath the body of the notebook and helps tilt the unit. For an extra \$299, the wedge is also available with two Type III PC Card slots in addition to the floppy disk drive. The system's lithium ion battery swivels down to reveal the back-panel ports.

The HiNote, with a travel weight of 6.2 pounds, has a built-in trackball with a generous wrist rest that surrounds the device. The left mouse button almost completely encircles the trackball, making it very easy to use (the HiNote Ultra uses a smaller version of this trackball). A flip-up keyboard provides access to the nickel hydride battery, hard disk, and memory.

The HiNote shares the same screen and PC Card slots as the HiNote Ultra but lacks the IR port, lithium ion battery, and built-in sound. It does, however, provide two things the HiNote Ultra lacks: a port for a port replicator (a \$299 option that also adds PC Card slots) and the ability to access the hard disk for upgrades. Although no screws are required to remove the hard disk, you do have to disconnect cables, making casual removal ill-advised.

The two units were both strong Windows performers. Both had above-average scores on our Winstone 95 and Disk WinMark 95 tests (helped by 12MB of RAM in the HiNote and 16MB of RAM in the



**Digital HiNote
Ultra CT475**



DFI MediaBook 5110T

SUMMARY OF FEATURES

Color Notebooks

Price (tested configuration) For companies that sell through dealers or resellers, assume street prices will be 10 to 15 percent lower than list prices. Some companies factor this discount into their quoted prices; in such cases, we indicate that the cited price is a street price.

System weight, travel weight The system weight includes the weight of the battery. The travel weight adds the weight of the AC adapter, the power cord, and the CD-ROM drive. But it does not include the weight of external floppy disk drives.

Resolutions and noninterlaced refresh rates supported on external display In addition to the information listed, all reviewed systems—except the Everex and Hewlett-Packard notebooks—are capable of displaying 640-by-480 noninterlaced external resolution at refresh rates of 60 Hz or better.

Virtual desktop When you use the notebook's LCD panel and an external monitor simultaneously, virtual desktop lets you display a higher resolution on the external monitor than the LCD panel is normally capable of displaying.

Installed/maximum hard disk capacity We report capacity in megabytes (1,048,576 bytes). Some manufacturers quote millions of bytes (which

makes capacity appear about 5 percent larger) on spec sheets.

NTSC video in/out ports meet specifications set by the National Television Standards Committee and let you output directly to a television set.

Full-size alphanumeric/cursor keys Full-size keys measure 19 mm horizontally from key center to key center.

PC Card slots were formerly called PCMCIA slots.

ACC—ACC Micro Electronics Inc.,
ALI—Acer Labs Inc.,
ASE—ASE Technology Inc.,
C&T—Chips & Technologies Inc.,
Chicom—Chicom Electronics,
CL—Cirrus Logic,
Dual—Dual Technology Enterprises Corp.,
FIC—First International Computer Inc.,
Kiwi—Kiwi Computer Inc.,
Microstar—Microstar Computer Corp.,
NTC—Nan Tan Computer Co.,
SIS—Silicon Integrated Systems Corp.,
Sunrex—Sunrex Technology Inc.,
TI—Texas Instruments Inc.,
Twinhead—Twinhead International Corp.,
Veridata—Veridata Electronics Inc.,
WD—Western Digital Corp.

SUITABILITY TO TASK

HiNote GT475

Desktop replacement	Fair
Road warrior	Good

SUITABILITY TO TASK

HiNote Ultra GT475

Desktop replacement	Fair
Road warrior	Excellent

SERVICE & RELIABILITY

Digital

Reliability	Average
Repair	Average
Technical support	Average
% needing repair	Average

HiNote Ultra). The HiNote Ultra also produced an above-average Graphics WinMark 95 score. The HiNote had an average WinDrain time of about 2 hours; the HiNote Ultra's endurance was slightly lower, despite its lithium ion battery.

Both systems also come with Digital utilities that help with software backup and power management, as well as on-line manuals and a Get-

ting Started guide. The HiNote Ultra includes Puma's TranXit IR file-transfer package, while the HiNote includes QuickLink II, which comes with its \$249 14.4-Kbps PC Card modem.

Digital's warranty includes three years of parts and labor and one year of its Passport service, which guarantees repair or replacement of the unit within 48 hours. Phone support is available 24 hours a day, seven days per week.—AY

Digital Equipment Corp., Maynard, MA; 800-642-4532; fax, 800-652-4532.

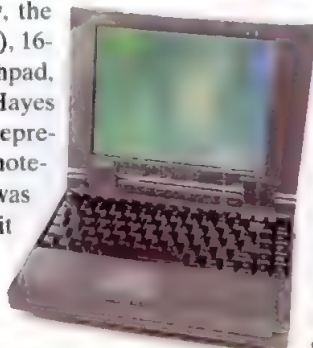
Circle 464 on reader service card

Epson America Inc.

ActionNote 880CX

The Epson ActionNote 880CX, based on a Cyrix Cx486DX2-80 CPU, offers an impressive array of features for its \$3,599 street price. It includes a 10.5-inch active-matrix screen (with a 10.3-inch dual-scan display, the unit costs about \$1,000 less), 16-bit sound, a responsive touchpad, and an internal 14.4-Kbps Hayes fax modem. This system represents Epson's full-featured notebook line, but because it was sent with 8MB of RAM, it was compared with machines in the value category despite its higher price.

Epson also markets the ActionNote 600 Series, de-



Epson ActionNote 880CX

signed for mainstream value buyers. Pricing for these units starts under \$2,000.

The 6.9-pound ActionNote model that we tested offers two PC Card Type II slots (usable as one Type III slot). The unit's 504MB hard disk is removable without a screwdriver, but it can be difficult to reconnect. By the time you read this, Epson will be selling this system with a 700MB hard disk for the same price.

The ActionNote did not fare well on our tests, largely because it used only 8MB of RAM. The unit posted below-average scores on all of our Windows-based tests, although its CPUmark₁₆ score was average, thanks to 256K of L2 cache. On our WinDrain test, the ActionNote's nickel hydride battery managed 2:21.

Epson has added some user-friendly extras to the ActionNote. On the bottom of the unit you'll find a sticker with Epson's toll-free road-service number and hours. Manuals for the system unit and ClarisWorks 3.0 for Windows (bundled with the ActionNote) are on-line.

The ActionNote has a one-year warranty. It includes Epson Extra Care Road Service, which replaces damaged units within about 24 hours.—AY

Epson America Inc., Torrance, CA; 800-289-3776, ext. 3000; 310-782-0770; fax, 310-782-4248.

Circle 465 on reader service card

SUITABILITY TO TASK

ActionNote 880CX

Desktop replacement	Fair
Road warrior	Good

SERVICE & RELIABILITY

Epson America

Reliability	Average
Repair	Average
Technical support	Average
% needing repair	Average

SUMMARY OF FEATURES

Color Notebooks

■ YES ■ NO

In alphabetical order by company

	Altima Virage II 486DX4/100	Altima Virage II 486DX2/50	AMS MediaPro	AMS TravelPro 350C	AMS MediaPro II	ARMNote TS30PH	ARMNote TS30MC	Aspen Universa-CD
Price (tested configuration)	\$3,835 (list)	\$2,298 (list)	\$4,695 (list)	\$2,270 (list)	\$4,645 (list)	\$4,199 (list)	\$2,199 (list)	\$4,665 (list)
Product category	Full-featured	Value	Full-featured	Value	Multimedia	Full-featured	Value	Multimedia
System weight, travel weight (pounds)	6.9, 7.9	6.8, 7.7	7.8, 8.7	6.9, 8	7.9, 9.1	6.8, 8	6.5, 7.6	8.2, 9.4
Dimensions (HWD, in inches)	2 x 11.5 x 8.8	2 x 11.3 x 8.6	2.4 x 11.7 x 10	2.2 x 11.3 x 8.6	2.4 x 11.7 x 10	2 x 11 x 8.5	2 x 11 x 8.8	2.5 x 11.5 x 9
DOS, Windows versions installed	6.22, 3.11	6.22, 3.11	6.22, Win/WG 3.11	6.22, Win/WG 3.11	6.22, Win/WG 3.11	6.22, Win/WG 3.11	6.22, Win/WG 3.11	6.22, Win/WG 3.11
Motherboard Components								
Processor type and speed	DX4/100	486DX2/50	Pentium/90	486DX2/50	DX4/100	Pentium/90	486DX2/66	DX4/100
Installed/maximum system RAM	16MB, 32MB	8MB, 32MB	16MB, 64MB	8MB, 64MB	16MB, 64MB	16MB, 40MB	8MB, 20MB	16MB, 64MB
Installed/maximum processor cache	None, none	None, none	None, none	None, none	None, none	256K, 256K	None, none	256K, 1MB
Motherboard manufacturer	Twinhead	Twinhead	Dual	Acer	Dual	Compal	Compal	Microstar
Chip set manufacturer	Pico Power	Pico Power	ACC	ALI	ACC	VLSI	Pico Power	SIS
BIOS manufacturer and version (or date)	Phoenix (1/06/95)	Phoenix (1/06/95)	Phoenix (1/24/95)	Phoenix (1/25/95)	Phoenix (1/24/95)	Phoenix (12/23/94)	SystemSoft (8/04/93)	AMI 1.27
Flash BIOS/Plug and Play BIOS	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Display								
LCD-panel specifications	9.4" active-matrix VGA, 8-bit color	9.5" dual-scan VGA, 8-bit color	9.5" active-matrix VGA, 16-bit color	9.5" dual-scan VGA, 8-bit color	9.5" active-matrix VGA, 16-bit color	10.5" active-matrix VGA, 24-bit color	10.3" dual-scan VGA, 16-bit color	9.5" active-matrix VGA, 24-bit color
Graphics chip set manufacturer and model	WD90C24A2	WD90C24A2	WD90C24A	WD90C24A	WD90C24A	C&T 65545	C&T 65540	C&T 65545
Graphics RAM and type	1MB DRAM	1MB DRAM	1MB VRAM	1MB VRAM	1MB VRAM	1MB VRAM	1MB VRAM	1MB VRAM
Resolutions and noninterlaced refresh rates supported on external display	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 63 Hz, 1,024 x 768 at 63 Hz, 1,280 x 1,024 at 63 Hz	800 x 600 at 62 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 57 Hz, 1,280 x 1,024 at 57 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 768 at 60 Hz	800 x 600 at 56 Hz
Simultaneous external display, virtual desktop	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Mass Storage								
Installed/maximum hard disk capacity	737MB, 810MB	328MB, 810MB	772MB, 1GB	772MB, 1GB	772MB, 1GB	688MB, 720MB	503MB, 810MB	772MB, 810MB
Removable hard disk	■	■	■	■	■	■	■	■
Floppy disk drive	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Multimedia Features								
Internal CD-ROM drive	None	None	None	None	2X, removable	None	None	2X, removable
Sound synthesis	16-bit FM	16-bit FM	16-bit FM	None	16-bit FM	16-bit FM and wavetable	16-bit FM and wavetable	16-bit FM
Built-in speakers	2	2	2	None	2	2	1	2
Line-in/line-out/microphone/speaker jacks	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
NTSC video in/out	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Communications and Expansion								
Modem installed	None	None	14.4-Kbps integrated	14.4-Kbps PC Card	14.4-Kbps PC Card	None	None	14.4-Kbps PC Card
Infrared interface	None	None	None	None	None	115-Kbps	None	None
Serial/parallel/VGA ports	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
External keyboard/mouse ports	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
16550 UART/ECP/EPP support	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
PC Card slots	Two Type II or one Type III	Two Type II or one Type III	One Type II and one Type III	One Type II and one Type III	One Type II and one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III
List price of docking station/port replicator	N/A*, \$199	N/A*, \$199	\$439, N/A*	N/A*, N/A*	\$439, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*
Input Devices								
Full-size alphanumeric/cursor keys	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Type of integrated pointing device installed	Trackball	Trackball	Trackball	Trackball	Pointing stick	Trackball	Trackball	Pointing stick
Power								
Battery type	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride
Rated charge time while on, off	N/A**, 2:30	N/A**, 2:30	6:00, 2:00	6:00, 2:00	6:00, 2:00	8:00, 1:30	3:00, 1:30	6:00, 3:30
Standby/hibernation mode	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Battery hot-swapping	■	■	■	■	■	■	■	■
Service and Support								
Warranty on parts/labor	1 year/1 year	1 year/1 year	3 years/3 years	1 year/1 year	3 years/3 years	1 year/3 years	1 year/3 years	1 year/2 years
On-site service	N/A†	N/A†	N/A†	N/A†	N/A†	\$230 (1 year)	\$230 (1 year)	N/A†
24-hour, 7-day live technical support	■	■	■	■	■	■	■	■

N/A*—Not applicable: The company does not offer this peripheral or did not supply it for testing

N/A**—Not applicable: The unit cannot charge when powered on.

N/A†—Not applicable: The company does not offer on-site service for this product.

1 This port is not full-size.

2 Though most Type III PC Card slots can accept two Type II cards, this slot accepts only one Type II card

COVER STORY
Color Notebooks

Continues

AST Ascentia 950N	AST Ascentia 910N	AstroNote SKD III	AT&T Globalyst 250P	AT&T Globalyst 200S	AT&T Globalyst 130	Austin Vista Notebook	Austin StepLite Notebook	BSI NP7659T	BSI NP7657D
\$5,498 (list)	\$4,448 (list)	\$2,795 (list)	\$7,280 (street)	\$3,455 (street)	\$2,221 (street)	\$3,319 (list)	\$2,344 (list)	\$3,780 (list)	\$2,295 (list)
Full-featured	Value	Full-featured	Full-featured	Value	Subnotebook	Value	Subnotebook	Full-featured	Value
6 2, 7	6 2, 7	6 9, 8 2	7 3, 8 6	6 9, 7 8	5 1, 6	6 7, 7 6	4 8, 5 7	7 5, 8 7	7 1, 8 3
2 x 11.5 x 8.5	2 x 11.5 x 8.5	2.1 x 11.5 x 9	2.4 x 11.5 x 9	2.4 x 11.3 x 8.9	2 x 10.5 x 8	1.8 x 11.8 x 9.5	1.5 x 10.5 x 7.8	2.3 x 11 x 9.5	2.3 x 11 x 9.5
6 22, 3 1	6 22, 3 1	6 22, WfWG 3 11	6 22, WfWG 3 11	6 22, WfWG 3 11	6 22, WfWG 3 11	6 22, WfWG 3 11	6 22, WfWG 3 11	6 22, WfWG 3 11	6 22, WfWG 3 11
Pentium/75	DX4/75	DX4/100	Pentium/75	DX4/75	DX4/75	DX4/100	486DX2/50	Pentium/90	Pentium/75
16MB, 40MB	16MB, 32MB	16MB, 32MB	20MB, 40MB	12MB, 20MB	12MB, 20MB	8MB, 28MB	8MB, 20MB	16MB, 40MB	8MB, 40MB
256K, 256K	None, none	None, none	256K, 256K	None, none	None, none	None, none	None, none	256K, 256K	256K, 256K
AST	AST	Dual	NEC	Samsung	Mitac	Chicony	Quanta	Clevo	Clevo
Pico Power	VLSI	ACC	Pico Power	Pico Power	Pico Power	Pico Power	ACC	ACC	ACC
AST 1 00 08	AST 2	AMI (12/07/94)	Phoenix (1/09/93)	Phoenix (6/10/94)	SystemSoft (5/03/94)	Phoenix (1/19/95)	Phoenix (2/17/95)	AMI (6/06/92)	AMI (6/06/92)
■ ■	■	■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
10.5" active-matrix SVGA, 16-bit color	10.5" active-matrix VGA, 16-bit color	9.5" active-matrix VGA, 8-bit color	10.5" active-matrix SVGA, 8-bit color	10.4" dual-scan VGA, 8-bit color	10.4" dual-scan VGA, 8-bit color	11.3" dual-scan VGA, 16-bit color	9.5" dual-scan VGA, 8-bit color	9.5" active-matrix VGA, 8-bit color	10.3" dual-scan VGA, 8-bit color
CL-GD7543	WD90C24A	C&T 65540	C&T 65545	WD90C24A	C&T 65535	C&T 65540	C&T 65535	C&T 65545	C&T 65545
1MB DRAM	1MB VRAM	1MB VRAM	1MB DRAM	1MB DRAM	512K DRAM	1MB DRAM	512K DRAM	1MB DRAM	1MB DRAM
800 x 600 at 75 Hz, 1,024 x 768 at 75 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 72 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 56 Hz, 1,024 x 768 at 60 Hz, 1,280 x 1,024 at 60 Hz	800 x 600 at 56 Hz, 1,024 x 768 at 60 Hz, 1,280 x 1,024 at 60 Hz
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
503MB, 1GB	503MB, 700MB	503MB, 810MB	772MB, 810MB	335MB, 540MB	335MB, 810MB	772MB, 810MB	335MB, 540MB	772MB, 810MB	335MB, 810MB
■	■	■	■	■	■	■	■	■	■
Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	Internal	Internal
None	None	None	None	None	None	None	None	None	None
16-bit wavetable	None	16-bit FM	16-bit FM	16-bit FM	16-bit FM	16-bit FM	None	16-bit FM	16-bit FM
1	None	2	1	2	1	2	None	2	2
■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
None	None	None	None	None	None	14.4-Kbps PC Card	14.4-Kbps PC Card	None	None
115-Kbps	None	None	None	None	None	None	None	None	None
■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	One Type III	One Type II and one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III
\$489, \$149	\$489, \$149	N/A*, N/A*	\$955, N/A*	N/A*, \$95	N/A*, \$95	N/A*, N/A*	N/A*, N/A*	\$465, N/A*	\$465, N/A*
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Pointing stick	Pointing stick	Pointing stick	Trackball	Trackball	Trackball	Pointing stick	Trackball	Trackball	Trackball
Lithium ion	Lithium ion	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride
5:30, 2:30	5:30, 2:30	3:00, 1:30	2:30, 1:30	4:30, 2:30	2:00, 2:00	4:00, 3:00	5:00, 2:30	N/A**, 2:00	N/A**, 2:00
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
3 years/3 years	3 years/3 years	1 year/1 year	3 years/3 years	3 years/3 years	1 year/1 year	1 year/1 year	1 year/1 year	1 year/1 year	1 year/1 year
N/A†	N/A†	N/A†	\$149 (3 years)	\$149 (3 years)	\$79 (1 year)	N/A†	N/A†	N/A†	N/A†
■	■	■	■	■	■	■	■	■	■

WE JUST REINVENTED THE MOST POWERFUL PC VERY LITTLE MONEY CAN BUY.

The new Compaq® ProLinea® Family now combines real affordability with innovative new features that make it the most powerful desktop in its class. To start, you can choose the processor you want—from extremely fast (486DX2/50MHz) to blindingly fast (Pentium™ 100MHz). And the ProLinea is available in three new form factors: 3 slots/3 bays, 4 slots/4 bays, or 5 slots/5 bays.

We've also added TriFlex/PCI Architecture, PCI Local Bus Graphics, and a host of other features you'll find in the chart to the right. And, naturally, we've made the new Compaq ProLinea Plug and Play compliant. In short, the new ProLinea gives you a whole new way to think about business computing. And there's no easier way to get your hands on one than by calling Compaq DirectPlus.®



THE NEW
COMPAQ PROLINEA FAMILY

CHOOSE YOUR COMPAQ PROLINEA



Processor	486DX 2/66	Pentium 75MHz	Pentium 75MHz
Processor Upgradable	Yes	Yes	Yes
Std./Max. Memory	8MB/136MB	8MB/192MB	16MB/192MB
Hard Drive	420MB	420MB	720MB
Cache Internal	8KB	16KB	16KB
Cache External	256KB (optional)	256KB	256KB
Local Bus Graphics	PCI	PCI	PCI
Video Memory/Max.	1MB/2MB	1MB/2MB	2MB/4MB
Compaq 150 Color Monitor	Yes	Yes	Yes
Diskette Drive	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB
Expansion Slots (Total)	3	4	5
Drive Bays (Total)	3	4	5
Ports: Serial/Parallel	1/1 (ECP)	1/1 (ECP)	1/1 (ECP)
Security Features	Yes	Yes	Yes
101-Key Keyboard, Mouse	Yes	Yes	Yes
Software Preinstalled	MS-DOS® 6, MS-Windows® 3.1	MS-DOS 6, MS-Windows 3.1	MS-DOS 6, MS-Windows 3.1
Energy Star Compliant	Yes	Yes	Yes
Warranty†	3-Year	3-Year	3-Year
Price*	\$1,949	\$2,319	\$3,119

If your business requires a network solution, find out how the new Deskpro® can change the way you manage and support your network. It's all part of what we call Intelligent Manageability: including Asset Control, Fault Management, and Compaq IntelliSafe™ hard drives. For more information, just give us a call.

*Call for lease price. Leasing is provided by GE Capital Services for a term of 36 months and is subject to approved credit and certain terms and conditions. Call for details. Reseller prices may vary. †Restrictions and exclusions apply. Certain monitors, battery packs and options are covered by a One Year Warranty. ProLinea is covered by a 3-Year Warranty. © 1995 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. Deskpro and ProLinea are registered trademarks, DirectPlus is a registered service mark, and IntelliSafe is a trademark of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft, MS-DOS and Windows are registered trademarks of Microsoft Corporation. Pentium is a trademark of Intel Corporation. Offer available in the U.S. only.

COMPAQ
DirectPlus



1-800-888-5907

Weekdays 7-7, Sat. 9-3 CST

Ask for our new free catalog

Or for the name of your nearest Compaq Authorized Reseller, call 1-800-345-1518.

SUMMARY OF FEATURES

Color Notebooks

■ YES ■ NO

In alphabetical order by company

	BSI NP95490	Canon Innova Book 200LS IB100/520LS	CTX EzBook	Dell Latitude XP4100CX	Dell Latitude 475C	Dell MediaBook 5110T	Digital HiNote CT475	Digital HiNote Ultra CT475
Price (tested configuration)	\$2,580 (list)	\$3,199 (street)	\$2,549 (street)	\$4,897 (list)	\$2,298 (list)	\$3,995 (street)	\$3,539 (list)	\$4,999 (list)
Product category	Multimedia	Value	Value	Full-featured	Value	Full-featured	Value	Subnotebook
System weight, travel weight (pounds)	7.7, 9	6.6, 7.5	6.1, 6.6	6, 6.9	5.9, 6.7	7.5, 8.4	5.4, 6.2	4.2, 4.8
Dimensions (HWD, in inches)	2.5 x 11.8 x 9	1.8 x 11.8 x 9.5	2 x 11 x 8.5	2 x 11 x 8.6	1.9 x 10.4 x 8.8	2.5 x 11 x 8.6	1.7 x 11 x 8.5	1.2 x 11 x 8.5
DOS, Windows versions installed	6.22, WinWG 3.11	6.22, WinWG 3.11	6.22, 3.11	6.2, WinWG 3.11	6.2, WinWG 3.11	6.22, WinWG 3.11	6.22, WinWG 3.11	6.22, WinWG 3.11
Motherboard Components								
Processor type and speed	DX4/100	DX4/100	DX4/75	DX4/100	DX4/75	DX4/100	DX4/75	DX4/75
Installed/maximum system RAM	16MB, 64MB	8MB, 28MB	8MB, 32MB	20MB, 36MB	8MB, 20MB	16MB, 36MB	12MB, 20MB	16MB, 24MB
Installed/maximum processor cache	256K, 1MB	None, none	None, none	None, none	None, none	128K, 128K	None, none	None, none
Motherboard manufacturer	Microstar	Chicony	Veridata	Sony	Sony	NTC	Citizen	Citizen
Chip set manufacturer	SIS	Pico Power	WD	WD	OPTi	SIS	Pico Power	Pico Power
BIOS manufacturer and version (or date)	AMI (3/02/95)	Phoenix (4/19/94)	AMI (11/11/92)	Phoenix (2/17/95)	Phoenix (12/23/94)	Award (12/16/94)	SystemSoft (3/21/95)	SystemSoft (3/21/95)
Flash BIOS/Plug and Play BIOS	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Display								
LCD-panel specifications	10.3" dual-scan VGA, 8-bit color	11.3" dual-scan VGA, 16-bit color	10.5" dual-scan VGA, 8-bit color	9.5" active-matrix VGA, 16-bit color	9.5" dual-scan VGA, 16-bit color	10.5" active-matrix VGA, 8-bit color	9.5" active-matrix VGA, 8-bit color	9.5" active-matrix VGA, 8-bit color
Graphics chip set manufacturer and model	C&T 65545	C&T 65545	WD90C24A	WD90C24A	WD90C24A	CL-GD6440	C&T 65540	C&T 65545
Graphics RAM and type	1MB DRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB VRAM	1MB DRAM	1MB VRAM	1MB VRAM
Resolutions and noninterlaced refresh rates supported on external display	800 x 600 at 56 Hz, 1,024 x 768 and 1,280 x 1,024 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 75 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 72 Hz	800 x 600 at 56 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 56 Hz, 1,024 x 768 at 60 Hz
Simultaneous external display, virtual desktop	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Mass Storage								
Installed/maximum hard disk capacity	503MB, 810MB	501MB, 520MB	498MB, 810MB	772MB, 810MB	325MB, 524MB	772MB, 810MB	335MB, 528MB	335MB, 528MB
Removable hard disk	■	■	■	■	■	■	■	■
Floppy disk drive	External	Internal	Internal	Internal	Internal	Internal	Internal	External
Multimedia Features								
Internal CD-ROM drive	2X, removable	None	None	None	None	None	None	None
Sound synthesis	16-bit FM	16-bit	16-bit FM	None	None	8-bit FM	None	16-bit FM
Built-in speakers	2	2	1	None	None	1	None	1
Line-in/line-out/microphone/speaker jacks	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
NTSC video in/out	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Communications and Expansion								
Modem installed	None	None	None	14.4-Kbps PC Card	14.4-Kbps PC Card	14.4-Kbps PC Card	None	None
Infrared interface	None	None	None	None	None	None	None	58-Kbps
Serial/parallel/VGA ports	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
External keyboard/mouse ports	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
16550 UART/ECP/EPP support	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
PC Card slots	Two Type II or one Type III	Two Type II or one Type III	One Type II and one Type III	Two Type II or one Type III	Two Type II or one Type III	One Type II and one Type III	Two Type II or one Type III	Two Type II or one Type III
List price of docking station/port replicator	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, \$199	N/A*, N/A*	\$495, \$99	N/A*, \$299	N/A*, N/A*
Input Devices								
Full-size alphanumeric/cursor keys	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Type of integrated pointing device installed	Pointing stick	Pointing stick	Touchpad	Trackball	Trackball	Trackball	Trackball	Trackball
Power								
Battery type	Nickel hydride	Nickel hydride	Nickel hydride	Lithium ion	Nickel hydride	Nickel hydride	Nickel hydride	Lithium ion
Rated charge time while on, off	2:00, 2:00	2:00, 2:00	2:00, 2:00	1:30, 1:30	2:30, 2:30	3:00, 2:00	3:00, 3:00	3:00, 3:00
Standby/hibernation mode	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Battery hot-swapping	■	■	■	■	■	■	■	■
Service and Support								
Warranty on parts/labor	1 year/1 year	1 year/1 year	2 years/2 years	3 years/3 years	1 year/1 year	1 year/1 year	3 years/3 years	3 years/3 years
On-site service	N/A†	N/A†	N/A†	Included (1 year)	N/A†	\$90 (1 year)	\$108 (1 year)	\$108 (1 year)
24-hour, 7-day live technical support	■	■	■	■	■	■	■	■

N/A*—Not applicable. The company does not offer this peripheral or did not supply it for testing.
N/A**—Not applicable. The unit cannot charge when powered on.
N/A†—Not applicable. The company does not offer on-site service for this product.

1 This port is not full-size.

2 Though most Type III PC Card slots can accept two Type II cards, this slot accepts only one Type II card.

COVER STORY

Color Notebooks

Continues



Epson ActionNote 880CX	Ergo PowerBrick 50	Ergo SubBrick 75	Everex StepNote P75	Everex StepNote D100	FutureMate FM309T	FutureMate FM559D	Gateway ColorBook ² DX4/100 Deluxe	Gateway Liberty DX4/100 Best Buy	HP OmniBook 4000CT
\$3,599 (street)	\$2,495 (list)	\$2,895 (list)	\$3,995 (street)	\$2,495 (street)	\$4,395 (list)	\$3,200 (list)	\$3,499 (list)	\$4,499 (list)	\$4,346 (street)
Value	Value	Subnotebook	Full-featured	Value	Full-featured	Multimedia	Value	Subnotebook	Full-featured
6.4, 6.9	6.5, 7.8	4.8, 5.7	6.1, 7.1	5.9, 6.9	6.8, 8	7.5, 8.8	5.8, 6.6	4.3, 5.4	7.2, 8.1
2 x 11.5 x 9	2 x 11 x 8.5	1.5 x 10.5 x 7.8	2 x 11.4 x 8.6	1.5 x 11.5 x 8.7	2 x 11 x 8.5	2.4 x 11.7 x 10	1.8 x 11.7 x 8.5	1.6 x 10 x 8	2 x 11.5 x 8.8
6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, WfWG 3.11	6.2, WfWG 3.11
Cx486DX2-80	486DX2/50	DX4/75	Pentium/75	DX4/100	Pentium/90	DX4/100	DX4/100	DX4/100	DX4/100
8MB, 24MB	8MB, 32MB	12MB, 20MB	16MB, 32MB	8MB, 32MB	16MB, 40MB	16MB, 32MB	8MB, 24MB	24MB, 24MB	16MB, 36MB
256K, 256K	None, none	None, none	256K, 256K	None, none	256K, 256K	None, none	None, none	256K, 256K	None, none
ASE	Arima	Quanta	FIC	FIC	Compal	Dual	Sotec	Sanyo	Twinhead
ACC	ACC	ACC	Pico Power	Pico Power	VLSI	ACC	Pico Power	OPTi	Pico Power
Phoenix (4/19/90)	Phoenix (4/19/90)	Phoenix (2/17/95)	SystemSoft (4/23/95)	SystemSoft (4/23/95)	Phoenix (1/27/91)	AMI (3/09/95)	SystemSoft 3.00.00	SystemSoft 1.31	Phoenix (12/07/94)
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
10.5" active-matrix VGA, 8-bit color	9.5" dual-scan VGA, 8-bit color	9.5" dual-scan VGA, 8-bit color	10.4" active-matrix VGA, 12-bit color	10.5" dual-scan VGA, 8-bit color	10.5" active-matrix VGA, 8-bit color	11.4" dual-scan SVGA, 8-bit color	10.3" dual-scan VGA, 8-bit color	10.4" dual-scan VGA, 8-bit color	10.5" active-1 matrix VGA, 16-bit color
C&T 65535	WD90C24A	C&T 65535	C&T 65545	C&T 65545	C&T 65545	C&T 65545	C&T 65545	C&T 65545	WD90C24A
512K DRAM	1MB VRAM	512K DRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB VRAM	1.5MB DRAM	1MB DRAM	1MB DRAM
800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
504MB, 810MB	335MB, 810MB	335MB, 540MB	772MB, 1GB	335MB, 1GB	772MB, 810MB	772MB, 810MB	516MB, 720MB	683MB, 720MB	499MB, 810MB
■	■	■	■	■	■	■	■	■	■
Internal	Internal	External	Internal	Internal	Internal	Internal	Internal	External	Internal
None	None	None	None	None	None	2X, removable	None	None	None
16-bit FM	16-bit	None	16-bit FM and wavetable	16-bit FM and wavetable	16-bit FM	16-bit FM and wavetable	16-bit	None	16-bit FM
1	1	None	2	2	2	2	1	1	2
■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
14.4-Kbps integrated	14.4-Kbps integrated	None	14.4-Kbps integrated	None	None	None	14.4-Kbps PC Card	14.4-Kbps PC Card	28.8-/14.4-Kbps integrated
None	None	None	115-Kbps	115-Kbps	9,600-bps	None	None	115-Kbps	115-Kbps
■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III
N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, \$49	N/A*, N/A*	N/A*, \$299
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Touchpad	Trackball	Trackball	Touchpad	Trackball	Trackball	Pointing stick	Pointing stick	Pointing stick	Trackball
Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride
2:00, 1:30	8:00, 2:30	5:00, 2:30	3:00, 1:00	3:00, 1:00	8:00, 1:30	3:00, 2:00	3:00, 1:00	1:00, 1:00	3:00, 2:00
■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
■	■	■	■	■	■	■	■	■	■
1 year/1 year	4 years/4 years	4 years/4 years	2 years/2 years	2 years/2 years	1 year/1 year	1 year/1 year	1 year/1 year	1 year/1 year	3 years/3 years
N/A†	Included (4 years)	Included (4 years)	N/A†	N/A†	Varies	Varies	N/A†	N/A†	N/A†
■	■	■	■	■	■	■	■	■	■

SUMMARY OF FEATURES

Color Notebooks

PC MAGAZINE
EDITOR'S CHOICE

■ YES ■ NO

In alphabetical order by company

	HyperData HyperBook 900A	IBM ThinkPad 755CX	IBM ThinkPad 360CSE	IBM ThinkPad 755CD	IBM ThinkPad 701C	Maximus PowerMax	Maximus MediaNote	MaxTech YesBook X-740T
Price (tested configuration)	\$5,035 (list)	\$7,164 (list)	\$2,994 (list)	\$6,964 (list)	\$5,299 (list)	\$3,459 (list)	\$2,859 (list)	\$3,695 (list)
Product category	Full-featured	Full-featured	Value	Multimedia	Subnotebook	Full-featured	Multimedia	Full-featured
System weight, travel weight (pounds)	8.3, 9.6	6, 7	6.2, 7	7.3, 8.2	4.5, 5.1	6.7, 8.1	6.8, 8	6.8, 7.7
Dimensions (HWD, in inches)	2 x 11.5 x 8.8	2 x 11.6 x 8.3	2 x 11.7 x 8.3	2.3 x 11.6 x 8.3	1.8 x 9.6 x 8.8	2 x 11.5 x 8.8	2.5 x 11.5 x 8.8	2 x 11.3 x 8.8
DOS, Windows versions installed	6.22, Win/WG 3.11	IBM 7.0, 3.11	IBM 6.3, 3.11	IBM 6.3, 3.11	IBM 7.0, 3.11	6.2, Win/WG 3.11	6.2, Win/WG 3.11	6.2, Win/WG 3.11
Motherboard Components								
Processor type and speed	Pentium/90	Pentium/75	486DX2/50	DX4/100	DX4/75	Pentium/100	DX4/100	DX4/100
Installed/maximum system RAM	24MB, 40MB	16MB, 40MB	8MB, 20MB	16MB, 40MB	8MB, 24MB	16MB, 40MB	16MB, 32MB	16MB, 20MB
Installed/maximum processor cache	None, none	256K, 256K	None, none	None, none	None, none	None, none	None, none	None, none
Motherboard manufacturer	Sunrex	IBM	IBM	IBM	IBM	Sunrex	Sunrex	GVC
Chip set manufacturer	OPTi	Pico Power	Pico Power	Pico Power	OPTi	OPTi	OPTi	Pico Power
BIOS manufacturer and version (or date)	AMI (2/17/95)	IBM (2/27/95)	IBM (8/01/94)	IBM (10/07/94)	IBM (4/03/95)	AMI (2/17/95)	AMI (1992)	SystemSoft (8/19/94)
Flash BIOS/Plug and Play BIOS	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Display								
LCD-panel specifications	9.5" active-matrix VGA, 16-bit color	10.4" active-matrix VGA, 16-bit color	9.5" dual-scan VGA, 8-bit color	10.4" active-matrix VGA, 16-bit color	10.4" active-matrix VGA, 24-bit color	9.5" active-matrix VGA, 15-bit color	9.5" dual-scan VGA, 15-bit color	9.5" active-matrix VGA, 24-bit color
Graphics chip set manufacturer and model	C&T 65545	WD90C24A	WD90C24A	WD90C24A2	C&T 65545	C&T 65545	C&T 65540	C&T 65540
Graphics RAM and type	1MB DRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB DRAM
Resolutions and noninterlaced refresh rates supported on external display	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz	800 x 600 at 61 Hz	800 x 600 at 61 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz
Simultaneous external display, virtual desktop	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Mass Storage								
Installed/maximum hard disk capacity	772MB, 800MB	514MB, 1.2GB	328MB, 810MB	514MB, 810MB	514MB, 1.2GB	772MB, 810MB	503MB, 810MB	504MB, 800MB
Removable hard disk	■	■	■	■	■	■	■	■
Floppy disk drive	External	Internal	Internal	Internal	External	External	External	Internal
Multimedia Features								
Internal CD-ROM drive	None	None	None	2X, removable	None	None	2X	None
Sound synthesis	16-bit FM	16-bit FM	None	16-bit FM and wavetable	16-bit FM and wavetable	16-bit FM	16-bit FM	None
Built-in speakers	2	1	None	2	1	2	2	None
Line-in/line-out/microphone/speaker jacks	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
NTSC video in/out	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Communications and Expansion								
Modem installed	14.4-Kbps PC Card	14.4-Kbps integrated	None	14.4-Kbps integrated	14.4-Kbps integrated	None	None	14.4-Kbps PC Card
Infrared interface	None	115-Kbps	None	115-Kbps	115-Kbps	None	None	None
Serial/parallel/VGA ports	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
External keyboard/mouse ports	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
16550 UART/ECP/EPP support	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
PC Card slots	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III
List price of docking station/port replicator	N/A*, N/A*	\$599, \$109	\$599, \$109	\$599, \$109	\$710, included	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*
Input Devices								
Full-size alphanumeric/ cursor keys	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Type of integrated pointing device installed	Pointing key	Pointing stick	Pointing stick	Pointing stick	Pointing stick	Pointing key	Pointing key	Trackball
Power								
Battery type	Nickel hydride	Lithium ion	Nickel hydride	Nickel hydride	Nickel cadmium	Nickel hydride	Nickel hydride	Nickel hydride
Rated charge time while on, off	8:00, 8:00	2:00, 1:00	2:00, 1:30	1:42, 1:12	2:30, 1:00	2:00, 1:10	3:30, 2:00	1:30, 1:10
Standby/hibernation mode	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Battery hot-swapping	■	■	■	■	■	■	■	■
Service and Support								
Warranty on parts/labor	1 year/1 year	3 years/3 years	1 year/1 year	3 years/3 years	3 years/3 years	1 year/1 year	1 year/1 year	1 year/1 year
On-site service	\$269 (3 years)	\$40 (1 year)	\$40 (1 year)	\$40 (1 year)	N/A†	\$49 (1 year)	\$49 (1 year)	N/A†
24-hour, 7-day live technical support	■	■	■	■	■	■	■	■

N/A*—Not applicable: The company does not offer this peripheral or did not supply it for testing.
N/A**—Not applicable: The unit cannot charge when powered on.
N/A†—Not applicable: The company does not offer on-site service for this product.

1 This port is not full-size.
2 Though most Type III PC Card slots can accept two Type II cards, this slot accepts only one Type II card.

COVER STORY
Color Notebooks

Continues



MaxTech YesBook X-740C	Micro Express NP92DX4	MidWest Micro SoundBook Plus	MidWest Micro SoundBook II	MPC TouchNote	MPC CD-Book	NEC Versa P/75	NEC Versa V/50	Nova OpenNote	Panasonic V41
\$2,095 (list) Value 6.6, 7.5 2 x 11.3 x 8.8 6.2, W/WG 3 11	\$2,495 (list) Value 7.1, 8 2.5 x 11 x 8.6 6.22, 3 11	\$4,799 (list) Full-featured 6.8, 8.1 2 x 11 x 8.5 6.22, W/WG 3 11	\$3,599 (list) Value 6.1, 6.9 2 x 11 x 8.5 6.22, W/WG 3 11	\$2,149 (list) Value 6.1, 7.3 2 x 11 x 8.5 6.22, W/WG 3 11	\$2,998 (list) Multimedia 6.8, 7.9 2.5 x 11.5 x 8.8 6.22, W/WG 3 11	\$5,974 (list) Full-featured 7.3, 8.6 2.2 x 11.6 x 9.5 6.22, W/WG 3 11	\$3,924 (list) Value 7.8, 2 2 x 11.6 x 9.5 6.22, 3 1	\$1,875 (street) Value 6.2, 7.1 2 x 11.3 x 8.5 6.22, 3 1	\$7,399 (list) Multimedia 8.4, 9.6 2.5 x 11.5 x 9.5 6.2, 3 11
486DX2/66 8MB, 20MB None, none GVC Pico Power SystemSoft (8/19/94)	DX4/100 16MB, 36MB 128K, 128K NTC SIS Award (12/16/94)	Pentium/90 16MB, 40MB 256K, 256K Compal VLSI Phoenix (3/17/95)	DX4/100 12MB, 36MB 128K, 128K Compal Pico Power Phoenix (3/31/95)	DX4/75 8MB, 32MB None, none Veridata WD AMI (11/11/92)	DX4/100 16MB, 32MB None, none Sunrex OPTi AMI (2/23/95)	Pentium/75 16MB, 40MB 256K, 256K NEC Pico Power Phoenix (1/19/93)	486DX2/50 16MB, 20MB None, none NEC WD Phoenix (4/19/90)	Cx486DX2-66 8MB, 32MB None, none Kwii OPTi Award 4 50G	Pentium/75 16MB, 48MB 256K, 256K Matsushita Pico Power IBM (3/22/95)
10.3" dual-scan VGA, 8-bit color	10.3" dual-scan VGA, 8-bit color	10.4" active- matrix VGA, 16-bit color	10.5" active- matrix VGA, 16-bit color	10.5" dual-scan VGA, 8 bit color	9.5" dual-scan VGA, 8-bit color	10.4" active- matrix SVGA, 8-bit color	9.5" active- matrix VGA, 16-bit color	9.5" dual-scan VGA, 8-bit color	10.5" active- matrix VGA, 16-bit color
C&T 65540 1MB DRAM 800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	CL-GD6440 1MB DRAM 800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	C&T 65545 1MB VRAM 800 x 600 at 72 Hz, 1,024 x 768 at 70 Hz, 1,280 x 1,024 at 70 Hz	C&T 65545 1MB DRAM 800 x 600 at 72 Hz, 1,024 x 768 at 70 Hz, 1,280 x 1,024 at 70 Hz	WD90C24A 1MB VRAM 800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	C&T 65540 1MB DRAM 800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	C&T 65545 1MB DRAM 800 x 600 at 74 Hz, 1,024 x 768 at 60 Hz	WD90C24A 1MB DRAM 800 x 600 at 74 Hz, 1,024 x 768 at 60 Hz	C&T 65530 512K DRAM 800 x 600 at 70 Hz, 1,024 x 768 at 70 Hz	C&T 65545 1MB DRAM 800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz
325MB, 800MB	503MB, 810MB	689MB, 720MB	516MB, 720MB	335MB, 800MB	503MB, 800MB	772MB, 810MB	514MB, 810MB	324MB, 720MB	648MB, 680MB
Internal	Internal	Internal	Internal	Internal	External	Internal	Internal	Internal	Internal
None	None	None	None	None	2X	None	None	None	2X
None	16-bit FM	16-bit FM	16-bit FM	16-bit FM and wavetable	16-bit FM and wavetable	16-bit FM	None	None	16-bit wavetable
None	1	2	2	1	2	1	None	None	2
14.4-Kbps PC Card	14.4-Kbps integrated	14.4-Kbps PC Card	None	None	None	None	None	None	None
None	None	115-Kbps	115-Kbps	None	None	None	None	None	None
Two Type II or one Type III	One Type II and one Type III	Two Type II or one Type III	Two Type II or one Type III	One Type II and one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	One Type II	Two Type II or one Type III
N/A*, N/A*	\$395, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	\$629, \$94	\$629, \$94	N/A*, N/A*	N/A*, N/A*
Trackball	Trackball	Pointing stick	Touchpad	Touchpad	Pointing key	Trackball	Trackball	Trackball	Trackball
Nickel hydride 1:30, 1:10	Nickel hydride 4:00, 2:00	Nickel hydride 8:00, 1:30	Nickel hydride 4:00, 2:00	Nickel hydride 1:00, 1:00	Nickel hydride 7:12, 3:00	Nickel hydride 2:07, 1:06	Nickel hydride 2:06, 1:05	Nickel hydride 2:30, 2:30	Nickel hydride 5:00, 3:30
1 year/1 year	2 years/2 years	3 years/3 years	3 years/3 years	1 year/1 year	1 year/1 year	3 years/3 years	3 years/3 years	1 year/1 year	3 years/3 years
N/A†	\$50 (1 year)	N/A†	N/A†	N/A†	N/A†	N/A†	N/A†	N/A†	N/A†



The New Texas Instruments TravelMate™ 5000

• 75 MHz Pentium processor • Two Edison™ ion battery packs • Serial infrared port • 10.4" Active Matrix or 10.5" Dual Scan displays • 594 million bytes (=500MB) or 810 million bytes (=773MB) Hard Disk Drives* • 8MB RAM, expandable to 32MB • 2MB Video memory • Multimedia package: Built-in 16-bit sound, internal speaker & dual mode microphone



Introducing The First Notebook To Maximize The Pentium's Full Potential.

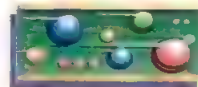
When the rush was on to introduce a notebook with a Pentium™ processor, Texas Instruments decided to do what others thought couldn't be done.

We created a notebook that maximizes Pentium performance by integrating *full PCI bus architecture* in our *TravelMate 5000*.



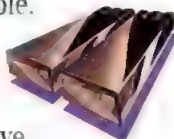
And for flexible connectivity, we designed a way to allow external access from the PCI bus to the latest peripherals.

It was a challenge we addressed for two simple reasons: to give users true desktop Pentium performance for *faster running software and expansion capabilities* for investment protection.



So now you have a notebook with smoother full-motion video and enhanced 3-D graphics. In addition, we designed the TravelMate 5000 to take advantage of the "plug and play" capabilities of Windows 95® when it becomes available.

But our engineers didn't stop there. *We added a second lithium ion battery* without sacrificing size, weight or eliminating a floppy drive.



In addition, wireless communication with other notebooks and desktops is very quick and easy with our integrated infrared capabilities.

The TI TravelMate 5000. For more information on what others thought you couldn't do with a notebook, simply call 1-800-TI-TEXAS (e-mail: 2ti@msg.ti.com).

EXTENDING YOUR REACH™

 **TEXAS
INSTRUMENTS**



Warranty may vary from country to country. Contact your local TI office for details. Batteries and options are covered by a one year limited warranty. *Depending on model. TravelMate and "Extending Your Reach" are trademarks of Texas Instruments. Windows 95 is a registered trademark of Microsoft Corporation. Pentium is a trademark and the Intel Inside logo is a registered trademark of Intel Corporation. © 1995 TI

CIRCLE 353 ON READER SERVICE CARD

SUMMARY OF FEATURES

Color Notebooks

	Sager NP7659T	Sager NP9549A	Samsung SENS700	Samsung NoteMaster S3945T	Sceptre SoundX Series 3000 Pentium 90	Sceptre SoundX Series 3000 Pentium 75	Sharp PC-8900	Sharp PC-3050
Price (tested configuration)	\$3,995 (list)	\$3,895 (list)	\$4,019 (list)	\$2,828 (list)	\$5,754 (list)	\$4,154 (list)	\$3,699 (street)	\$2,199 (street)
Product category	Full-featured	Multimedia	Full-featured	Value	Full-featured	Value	Full-featured	Value
System weight, travel weight (pounds)	7.6, 8.8	7.8, 9	6.1, 6.9	6.5, 7.2	6.8, 8	6.8, 8	6.8, 7.7	6.6, 9
Dimensions (HWD, in inches)	2.3 x 11 x 9.5	2.5 x 11.8 x 9	2.4 x 11.3 x 8.9	2.4 x 11.3 x 8.9	2.4 x 11 x 8.5	2.5 x 11 x 8.5	2.3 x 11.3 x 9	2.3 x 11.3 x 9
DOS, Windows versions installed	6.22, Win/WG 3.11	6.22, Win/WG 3.11	6.22, 3.11	6.2, 3.11	6.22, Win/WG 3.11	6.22, Win/WG 3.11	6.22, 3.11	6.22, 3.11
Motherboard Components								
Processor type and speed	Pentium/90	DX4/100	DX4/75	DX4/75	Pentium/90	Pentium/75	DX4/75	Cx486DX2-66
Installed/maximum system RAM	24MB, 40MB	16MB, 64MB	20MB, 36MB	8MB, 20MB	24MB, 40MB	16MB, 40MB	16MB, 36MB	8MB, 36MB
Installed/maximum processor cache	256K, 256K	256K, 1MB	None, none	None, none	256K, 256K	256K, 256K	None, none	None, none
Motherboard manufacturer	Clevo	Microstar	Samsung	Samsung	Compal	Compal	Twinhead	FIC
Chip set manufacturer	ACC	SIS	Pico Power	Pico Power	VLSI	VLSI	Pico Power	UMC
BIOS manufacturer and version (or date)	AMI (6/06/92)	AMI (3/02/95)	Phoenix (6/10/94)	Phoenix (6/10/94)	Phoenix (4/13/95)	Phoenix (2/13/95)	Phoenix (4/19/90)	Phoenix (4/19/90)
Flash BIOS/Plug and Play BIOS	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Display								
LCD-panel specifications	9.5" active-matrix VGA, 16-bit color	10.5" active- matrix VGA, 16-bit color	10.4" active- matrix VGA, 8-bit color	9.4" active-matrix VGA, 8-bit color	10.5" active- matrix VGA, 15-bit color	10.4" dual-scan VGA, 16-bit color	10.4" active- matrix VGA, 16-bit color	10.4" dual-scan VGA, 16-bit color
Graphics chip set manufacturer and model	C&T 65545	C&T 65545	WD90C24A	WD90C24A	C&T 65545	C&T 65545	C&T 65545	C&T 65545
Graphics RAM and type	1MB VRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB DRAM	512K VRAM	512K VRAM
Resolutions and noninterlaced refresh rates supported on external display	800 x 600 at 65 Hz, 1,024 x 768 at 65 Hz, 1,280 x 1,024 at 65 Hz	800 x 600 at 65 Hz, 1,024 x 768 at 65 Hz, 1,280 x 1,024 at 65 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 72 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz
Simultaneous external display, virtual desktop	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Mass Storage								
Installed/maximum hard disk capacity	772MB, 810MB	504MB, 810MB	313MB, 732MB	516MB, 732MB	688MB, 810MB	517MB, 810MB	481MB, 500MB	324MB, 500MB
Removable hard disk	■	■	■	■	■	■	■	■
Floppy disk drive	Internal	External	Internal	Internal	Internal	Internal	Internal	Internal
Multimedia Features								
Internal CD-ROM drive	None	2X, removable	None	None	None	None	None	None
Sound synthesis	16-bit FM	16-bit FM	16-bit	None	16-bit FM and wavetable	16-bit FM and wavetable	16-bit FM	16-bit FM
Built-in speakers	■	2	2	None	2	2	2	2
Line-in/line-out/microphone/speaker jacks	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
NTSC video in/out	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Communications and Expansion								
Modem installed	None	None	None	None	14.4-Kbps PC Card	14.4-Kbps PC Card	14.4-Kbps PC Card	14.4-Kbps integrated
Infrared interface	None	None	None	None	9,600-bps	9,600-bps	9,600-bps	115-Kbps
Serial/parallel/VGA ports	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
External keyboard/mouse ports	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
16550 UART/ECP/EPP support	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
PC Card slots	Two Type II or one Type III	Two Type II or one Type III	One Type II and one Type III	One Type II and one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	One Type II and one Type III
List price of docking station/port replicator	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, \$350	N/A*, N/A*
Input Devices								
Full-size alphanumeric/cursor keys	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Type of integrated pointing device installed	Trackball	Pointing stick	Trackball	Trackball	Trackball	Trackball	Touchpad	Touchpad
Power								
Battery type	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride
Rated charge time while on, off	N/A, 2:00	3:00, 3:00	5:00, 2:00	5:00, 2:00	8:00, 1:30	8:00, 1:30	3:00, 1:30	3:00, 1:30
Standby/hibernation mode	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Battery hot-swapping	■	■	■	■	■	■	■	■
Service and Support								
Warranty on parts/labor	1 year/1 year	1 year/1 year	2 years/2 years	2 years/2 years	3 years/3 years	3 years/3 years	3 years/3 years	1 year/1 year
On-site service	N/A†	N/A†	N/A†	N/A†	N/A†	N/A†	N/A†	N/A†
24-hour, 7-day live technical support	■	■	■	■	■	■	■	■

N/A*—Not applicable. The company does not offer this peripheral or did not supply it for testing.
N/A**—Not applicable. The unit cannot charge when powered on.
N/A†—Not applicable. The company does not offer on-site service for this product.

1 This port is not full-size.
2 Though most Type III PC Card slots can accept two Type II cards, this slot accepts only one Type II card.

COVER STORY
Color Notebooks

Continues



TI TravelMate 5000 75-MHz Pentium TFT	TI TravelMate 4000M/50 Dual Scan Color	Toshiba Satellite T4900CT	Toshiba Satellite T2100CS	Toshiba Satellite Pro T2150CDT	Twinhead Slimnote 5100T	Twinhead Slimnote 5100C	Unisys Travel Partner	Unisys Travel Asset	Wedge ShowBook P5
\$6,449 (street)	\$2,349 (street)	\$7,298 (list)	\$2,588 (list)	\$5,098 (list)	\$5,129 (list)	\$2,929 (list)	\$5,331 (list)	\$4,247 (list)	\$5,770 (list)
Full-featured	Value	Full-featured	Value	Multimedia	Full-featured	Value	Full-featured	Subnotebook	Full-featured
6.7, 7.2	6.5, 7	6.6, 7.6	6.7, 6.9	7.4, 7.7	6.9, 7.9	6.9, 7.9	7, 8.3	5.5, 6.6	6.8, 7.9
2.3 x 11 x 8.5	2 x 11 x 8.5	2.3 x 11.5 x 8.3	2.3 x 12 x 9	2.3 x 11.7 x 8.8	2 x 11.3 x 8.6	2 x 11.3 x 8.6	2 x 11 x 8.5	1.6 x 11.1 x 8.5	2 x 11 x 8.5
6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, 3.11	6.22, WfWG 3.11	6.22, 3.1	6.22, 3.1	6.22, WfWG 3.11	6.22, WfWG 3.11	6.22, 3.1
Pentium/75	486DX2/50	Pentium/75	486DX2/50	DX4/75	DX4/100	DX4/100	DX4/100	DX4/75	Pentium/90
16MB, 32MB	8MB, 20MB	16MB EDO, 40MB	8MB EDO, 28MB	16MB, 32MB	32MB, 32MB	16MB, 32MB	20MB, 32MB	20MB, 20MB	40MB, 40MB
256K, 256K	None, none	None, none	None, none	None, none	None, none	None, none	None, none	None, none	256K, 256K
TI	TI	Toshiba	Toshiba	Toshiba	Twinhead	Twinhead	Arima	Arima	Compal
ACC	TI	Toshiba	Toshiba	Toshiba	Pico Power	Pico Power	ACC	ACC	VLSI
Phoenix (4/19/94)	Phoenix (3/22/94)	Toshiba (11/01/94)	Toshiba (12/21/94)	Toshiba (2/16/95)	Phoenix (3/22/95)	Phoenix (3/22/95)	Phoenix A486v1.03	Phoenix 1.19	Phoenix (1/26/95)
10.4" active- matrix VGA, 16-bit color	9.5" dual-scan VGA, 8-bit color	10.4" active- matrix VGA, 8-bit color	10.5" dual-scan VGA, 8-bit color	10.5" active- matrix VGA, 8-bit color	9.5" active-matrix VGA, 8-bit color	10.4" dual-scan VGA, 8-bit color	9.5" active-matrix VGA, 8-bit color	9.5" active-matrix VGA, 8-bit color	10.5" active- matrix VGA, 8-bit color
CL-GD7543	CL-GD6440	C&T 65545	C&T 65540	C&T 65545	WD90C24A2	WD90C24A2	WD90C24A	WD90C24A	C&T 65545
2MB DRAM	1MB VRAM	1MB DRAM	1MB DRAM	1MB VRAM	1MB VRAM	1MB VRAM	1MB DRAM	1MB DRAM	1MB DRAM
800 x 600 at 74 Hz, 1,024 x 768 at 67 Hz, 1,280 x 1,024 at 67 Hz	800 x 600 at 74 Hz, 1,024 x 768 at 74 Hz, 1,280 x 1,024 at 74 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 72 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 72 Hz	800 x 600 at 57 Hz	800 x 600 at 56 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz
772MB, 772MB	325MB, 340MB	772MB, 810MB	335MB, 335MB	503MB, 503MB	772MB, 1GB	486MB, 1GB	500MB, 500MB	325MB, 340MB	689MB, 810MB
Internal	Internal	Internal	Internal	External	Internal	Internal	Internal	External	Internal
None	None	None	None	2X	None	None	None	None	None
16-bit FM and wavetable	16-bit FM and wavetable	16-bit FM	None	16-bit FM	16-bit FM and wavetable	16-bit FM and wavetable	16-bit FM	16-bit FM and wavetable	16-bit FM and wavetable
1	1	1	None	1	2	2	1	1	2
14.4-Kbps PC Card	14.4-Kbps PC Card	None	None	None	None	None	14.4-Kbps integrated	14.4-Kbps PC Card	None
115-Kbps	None	None	None	None	None	None	None	None	9,600-bps
Two Type II or one Type III	Two Type II or one Type III	One Type II and one Type III	One Type II and one Type III	One Type II and one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III
N/A*, N/A*	\$899, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, \$199	N/A*, \$199	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*
Pointing stick	Pointing stick	Pointing stick	Pointing stick	Pointing stick	Touchpad	Touchpad	Trackball	Trackball	Trackball
Lithium ion	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride
4:00, 4:00	3:00, 3:00	4:00, 1:30	N/A**, 2:30	N/A**, 2:30	8:00, 2:30	8:00, 2:30	4:00, 2:00	2:00, 1:30	8:00, 1:30
3 years/3 years	1 year/1 year	3 years/3 years	1 year/1 year	3 years/3 years	1 year/1 year	1 year/1 year	3 years/3 years	3 years/3 years	1 year/3 years
N/A†	N/A†	\$49.95 (1 year)	\$49.95 (1 year)	\$49.95 (1 year)	N/A†	N/A†	Varies	Varies	Varies

SUMMARY OF FEATURES

Color Notebooks

Ends

■ YES □ NO

In alphabetical order by company

	Wedge ShowBook EL	Wedge ShowBIZ	WinBook XP DX4-100 32/610 TFT	WinBook XP DX4-100 16/520 Dual-Scan Color	ZDS Z-Netflex	ZDS Z-Star EX	ZEOS Meridian 850A	ZEOS Meridian 850C
Price (tested configuration)	\$1,829 (list)	\$6,533 (list)	\$5,119 (list)	\$3,199 (list)	\$4,670 (street)	\$1,950 (street)	\$4,995 (list)	\$3,795 (list)
Product category	Value	Multimedia	Full-featured	Value	Full-featured	Value	Full-featured	Value
System weight, travel weight (pounds)	6 2, 7 1	7 9, 9 2	6 2, 7	6 2, 7	6 8 8	5 7, 6 4	6 7, 7 9	6 8 7 9
Dimensions (HWD, in inches)	2 x 11.3 x 8.5	2.5 x 11.8 x 9	2 x 11.3 x 8.8	2 x 11.3 x 8.8	2.2 x 11.8 x 8.6	2 x 10.8 x 8.6	2 x 11.5 x 8.7	2 x 11.5 x 8.7
DOS, Windows versions installed	6 22, 3 1	6 22, 3 1	6 22, Win/WG 3 11	6 22, Win/WG 3 11	6 22, Win/WG 3 11	6 2, 3 11	6 22, Win/WG 3 11	6 22, Win/WG 3 11
Motherboard Components								
Processor type and speed	Cx486DX2-66	486DX2/66	DX4/100	DX4/100	DX4/100	486DX2/50	Pentium/75	Pentium/75
Installed/maximum system RAM	8MB, 32MB	24MB, 32MB	32MB, 32MB	16MB, 32MB	16MB, 24MB	8MB, 20MB	16MB, 32MB	16MB, 32MB
Installed/maximum processor cache	None, none	None, 1MB	None, none	None, none	None, none	None, none	256K, 256K	256K, 256K
Motherboard manufacturer	Kirwi	Microstar	ASE	ASE	Sanyo	Inventec	Sanyo	Sanyo
Chip set manufacturer	OPTi	S S	ACC	ACC	OPTi	OPTi	Pico Power	Pico Power
BIOS manufacturer and version (or date)	Award 4 50G	AMI (12/15/93)	Phoenix 1 03	Phoenix (4/19/94)	Phoenix (1/24/95)	Phoenix (4/19/90)	SystemSoft 0 of 39	SystemSoft 0 of 39
Flash BIOS/Plug and Play BIOS	■	■	■	■	■	■	■	■
Display								
LCD-panel specifications	9 5" dual-scan VGA, 8-bit color	9 5" active-matrix VGA, 8-bit color	9 5" active-matrix VGA, 16-bit color	10 3" dual-scan VGA, 8-bit color	9 5" active-matrix VGA, 8-bit color	9 5" dual-scan VGA, 8-bit color	9 5" active-matrix VGA, 8-bit color	10 3" dual-scan SVGA, 8-bit color
Graphics chip set manufacturer and model	C&T 65530	C&T 65545	WD90C24C	WD90C24C	WD90C24A	C&T 65540	C&T 65545	C&T 65545
Graphics RAM and type	512K DRAM	1MB DRAM	1MB DRAM	1MB DRAM	1MB VRAM	1MB DRAM	1MB VRAM	1MB VRAM
Resolutions and noninterlaced refresh rates supported on external display	800 x 600 at 70 Hz, 1,024 x 768 at 70 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 60 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 75 Hz, 1,024 x 768 at 60 Hz	800 x 600 at 63 Hz, 1,024 x 768 at 62 Hz	800 x 600 at 63 Hz, 1,024 x 768 at 62 Hz
Simultaneous external display, virtual desktop	■	■	■	■	■	■	■	■
Mass Storage								
Installed/maximum hard disk capacity	335MB, 820MB	772MB, 722MB	771MB, 810MB	463MB, 810MB	772MB, 810MB	325MB, 340MB	773MB, 810MB	504MB, 810MB
Removable hard disk	■	■	■	■	■	■	■	■
Floppy disk drive	Internal	External	Internal	Internal	Internal	Internal	Internal	Internal
Multimedia Features								
Internal CD-ROM drive	None	2X, removable	None	None	None	None	None	None
Sound synthesis	None	16-bit FM and wavetable	16-bit FM	16-bit FM	16-bit	None	16-bit FM and wavetable	16-bit FM and wavetable
Built-in speakers	None	2	1	1	1	None	None	None
Line-in/line-out/microphone/speaker jacks	■	■	■	■	■	■	■	■
NTSC video in/out	■	■	■	■	■	■	■	■
Communications and Expansion								
Modem installed	None	None	14 4-Kbps integrated	14 4-Kbps integrated	14 4-Kbps PC Card	None	14 4-Kbps PC Card	None
Infrared interface	None	None	None	None	None	None	None	None
Serial/parallel/VGA ports	■	■	■	■	■	■	■	■
External keyboard/mouse ports	■	■	■	■	■	■	■	■
16550 UART/ECP/EPP support	■	■	■	■	■	■	■	■
PC Card slots	One Type II	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III	Two Type II or one Type III
List price of docking station/port replicator	N/A*, N/A*	N/A*, N/A*	\$399, N/A*	\$399, N/A*	\$679, N/A*	N/A*, N/A*	N/A*, N/A*	N/A*, N/A*
Input Devices								
Full-size alphanumeric/cursor keys	■	■	■	■	■	■	■	■
Type of integrated pointing device installed	Trackball	Pointing stick	Pointing stick	Pointing stick	Trackball	Pointing stick	Pointing stick	Pointing stick
Power								
Battery type	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride	Nickel hydride
Rated charge time while on, off	2:30, 2:30	4:30, 2:00	5:00, 2:00	5:00, 2:00	N/A**, 2:00	N/A**, 2:00	N/A**, 1:10	N/A**, 1:30
Standby/hibernation mode	■	■	■	■	■	■	■	■
Battery hot-swapping	■	■	■	■	■	■	■	■
Service and Support								
Warranty on parts/labor	1 year/3 years	1 year/3 years	1 year/1 year	1 year/1 year	3 years/3 years	1 year/1 year	1 year/1 year	1 year/1 year
On-site service	Varies	Varies	N/A†	N/A†	Included (1 year)	Included (1 year)	N/A†	N/A†
24-hour, 7-day live technical support	■	■	■	■	■	■	■	■

N/A*—Not applicable. The company does not offer this peripheral or did not supply it for testing.
N/A**—Not applicable. The unit cannot charge when powered on.
N/A†—Not applicable. The company does not offer on-site service for this product.

1 This port is not full-size.
2 Though most Type III PC Card slots can accept two Type II cards, this slot accepts only one Type II card.



"I want a notebook that computes for both
my business and my budget."



IBM Solution # 11395-D



a.k.a. "The ThinkPad® 755C"

With all the cost cutting and dollar squeezing going on these days, we probably don't need to tell you that money doesn't grow on trees. But it can grow on notebooks. Consider the value of the IBM ThinkPad 755C. 16-bit stereo sound. A 10.4" active-

- 486DX4 75MHz
- 340MB¹ removable hard drive
- Protected
- Infrared



- 256 colors (640x480)
- 16KB internal cache
- Built-in speaker and microphone
- Fax ID# 1619

matrix color screen. A speedy 75MHz processor. Features that ring up a surprisingly low grand total of just \$3,699.* Making every one of your dear pennies count. The ThinkPad 755C. One more reason why there is a difference.™

FOR DETAILS ON THINKPADS, CALL 1 800 772-2227*



*Measured diagonally. *PC Direct price. Reseller prices may vary. ¹MB=million bytes. Accessible capacity varies. IBM and ThinkPad are registered trademarks and "There is a difference" is a trademark of International Business Machines Corporation. *In Canada, call 1 800 485 7999. © 1995 IBM Corporation

Ergo Computing Inc.

PowerBrick 50 SubBrick 75

The two Ergo notebooks are among the most affordable in this roundup, and the PowerBrick 50 stands out further because of its excellent battery life. Although neither offers state-of-the-art design (such as a lithium ion battery, L2 cache, or a large screen) or top performance, both are reasonable choices.

The \$2,495 PowerBrick, a 486DX2/50-

SUITABILITY TO TASK

PowerBrick 50

Desktop replacement	Fair
Road warrior	Fair

SUITABILITY TO TASK

SubBrick 75

Desktop replacement	Poor
Road warrior	Good

based value notebook, is manufactured by Arima, which also makes systems for Unisys Corp. (reviewed elsewhere in this roundup). It has a 9.5-inch dual-scan screen and an internal 14.4-Kbps data/fax modem.

The PowerBrick's battery life is truly impressive. At 2:54, the unit had one of the best times overall. Its 7.8-pound travel weight is fair as well, making it an attractive choice for road warriors.

On the downside, the PowerBrick's performance was generally below average compared with other value notebooks. It came with 8MB of RAM, no L2 cache, and Western Digital's WD90C24A graphics chip set. Its Winstone 95 and Graphics WinMark 95 scores were below average; the Disk WinMark 95 score was above average for its class.

The SubBrick 75 is a solid road warrior. Not only does it offer a 5.7-pound travel weight, but its 2:17 battery life was one of the best of its class. It offers a 9.5-inch dual-scan display and costs \$2,895, an average price.

The SubBrick uses its DX4/75 CPU to good advantage. Despite its lack of L2 cache, the SubBrick managed to post an above-average Disk WinMark score and

a Winstone score that was average for its subnotebook group; its 12MB of RAM probably helped. The unit's Chips & Technologies 65535 graphics chip set did not aid its Graphics WinMark score, however, which was below average.

The SubBrick is made by Quanta, which also manufactures Austin Direct's StepLite Notebook (reviewed elsewhere in this issue).

Ergo includes top-notch service and support with these systems. Both are covered for four years on parts and labor and have seven-day, 24-hour phone support.—WPF

Ergo Computing Inc., Peabody, MA; 800-633-1925, 508-535-7510; fax, 508-535-7512.

Circle 466 on reader service card

Everex Systems Inc.

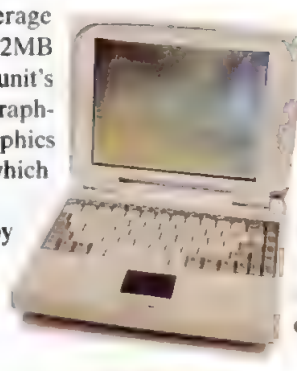
StepNote P75 StepNote D100

Both the DX4/100-based Everex StepNote D100 value notebook (\$2,495 street) and the full-featured Pentium/75-based StepNote P75 (\$3,995 street) have much to recommend them, including solid performance and an identically good feature set. There's actually very little to differentiate these units from each other, aside from processor speed, screen type, and amount of installed RAM. Everex says it gears the P75 toward business, while the D100 is targeted at the home and government markets.

The P75 came with a crisp 10.5-inch active-matrix display, while the D100's 10.5-inch display uses dual-scan technology.

They each incorporate two internal speakers and a microphone as well as an infrared port and two stacked Type II PC Card slots. The floppy disk drive can be removed to accommodate a second battery (\$145), and the hard disk can be removed as well.

The P75 came with a 14.4-Kbps data/fax modem installed (a \$145 option included in the above price), and it uses a trackpad as its pointing device (although a trackball is available if you wish, for the same price). The unit also had 16MB of



Everex StepNote P75.

RAM and a 256K cache as well as a Chips & Technologies 65545 graphics accelerator.

The D100 employs a trackball centered under the keyboard. It came with 8MB of RAM and no secondary cache but the same graphics-accelerator chip set as the P75.

On our benchmark tests, the P75 fared well compared with the other

full-featured systems. It had above-average scores on all our Windows-based tests. The P75's 1:13 battery life was abysmal, but the blow is lighter when you consider that it accommodates an optional second battery and its travel weight with one battery is only 7.1 pounds.

The D100 fared a little better on the battery tests than its sibling, with a 1:50 time. And like the P75, the D100's 6.9-pound travel weight and available second battery make it more attractive. Its benchmark test results are almost as good as those of the P75. Its Winstone 95 score was average, but the unit posted above-average Disk WinMark 95 and Graphics WinMark 95 scores.

The D100 can be user-upgraded to a 75-MHz Pentium for \$795. The upgrade is easy: Just flip up the keyboard and swap CPUs. Everex includes a two-year parts-and-labor warranty with each system.—WPF

Everex Systems Inc., Fremont, CA; 800-821-0806, 510-498-1111; fax, 510-683-2186.

Circle 467 on reader service card

FutureTech Systems Inc.

FutureMate FM309T FutureMate FM559D

The \$3,200 FutureMate FM559D is a surprisingly affordable multimedia notebook with a removable 800-by-600 dual-scan display that's particularly handy for presentations. The \$4,395

SUITABILITY TO TASK

StepNote P75

Desktop replacement	Good
Road warrior	Good

SUITABILITY TO TASK

StepNote D100

Desktop replacement	Good
Road warrior	Good



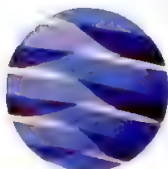
Ergo PowerBrick 50.



*"When my server overheats,
well, I've been known to show my temper."*



IBM Solution #92683-O



a.k.a. "Unique Cooling Design"

Most networks have enough kinks and bugs to make any hardworking IS manager hot under the collar. So we thought we'd give you one less thing to get steamed about. Our PC Server 320. Inside and out, it's been engineered to maximize cooling efficiency. From the

- NetFinity™ software
- 90MHz Pentium™ processor
- Dual-processor enabled
- Up to 256MB* parity memory
- SCSI-2 fast and wide



- 6 PCI/EISA slots
- 27GB storage
- Built-in CD-ROM drive
- 256KB of L2 cache
- Fax ID# 3170

key placement of its components to its double fans and flo-thru louvers. All aimed at optimizing airflow and heat dispersement. Reducing temperatures in your system and your bloodstream. PC Server 320. One more reason there is a difference."

FOR DETAILS ON PC SERVERS, CALL 1 800 772-2227*

NetFinity is a member of the SystemView™ family. *MB=million bytes. IBM and SystemView are registered trademarks and NetFinity and "There is a difference" are trademarks of International Business Machines Corporation. Pentium is a trademark of Intel Corp. *In Canada call 1 800 465-7999. ©1995 IBM Corporation



FutureMate FM309T, FutureTech's full-featured offering, makes a name for itself with great performance: It had the best Winstone 95 score in this roundup.

The FM559D is made by Dual Technology, the same company that manufactures systems for AMS (reviewed elsewhere in this issue). The FM309T is made by Compal, which manufactures notebooks from ARM Computer, MidWest Micro, Sceptre Technologies, and Wedge Technology.

Both systems feature built-in 16-bit audio. These units also have two Type II PC Card slots (usable as one Type III), but neither system came with a modem.

The DX4/100-based FM559D multimedia unit has a dual-scan Super VGA display that measures an impressive 11.4-inches diagonally (an active-matrix version is available for an additional \$759). For presentations, you can remove the screen and turn it by pulling two levers on both sides of the system. The FM559D's CD-ROM



FutureMate FM559D.

active-matrix display. It also integrates an infrared transceiver, stereo speakers, and a microphone.

At 2:02, the unit's WinDrain time was average for a full-featured notebook. On our benchmark tests, the FM309T posted the best Winstone 95 score overall as well as above-average Disk WinMark and Graphics WinMark scores.

FutureTech backs each of the units with a one-year parts-and-labor warranty.—WPF

FutureTech Systems Inc., Hackensack, NJ; 800-275-4414, 201-488-4414; fax, 201-488-4405.

Circle 468 on reader service card

Gateway 2000 Inc.

ColorBook² DX4/100 Deluxe Liberty DX4/100 Best Buy



The \$3,499 Colorbook² DX4/100 Deluxe is a solid value machine with good performance. The \$4,499 Liberty DX4/100 Best Buy, one of our Editors' Choices in this roundup, is one of the best subnote-

books to come along in a while. Both units have dual-scan passive-matrix displays: a 10.3-inch model on the Colorbook² and a 10.4-inch model on the Liberty. Both systems also have removable hard disks and easily upgradable memory.

The slightly larger screen is not the Liberty's only draw. This little unit packs a punch. It came loaded with 24MB of RAM, 256K of L2 cache, a speedy Chips & Technologies 65545 graphics accelerator, and a 683MB hard disk. As a result, it performed well above the average of this roundup's subnotebooks. It was also among the best within its CPU group and actually competed on favorable terms with some of the 75-MHz Pentium units.

This performance,

combined with the unit's 5.4-pound travel weight and 2:35 battery life, make it an excellent choice for road warriors. We originally tested the system with a nickel hydride battery, but at the last minute Gateway delivered a lithium ion battery (now standard) for the unit; we found the lithium ion battery lasted over 3 hours on our WinDrain test. Keep in mind, however, that to recharge the lithium ion battery fully takes 9 hours with the system on, though you should have an 80 percent charge after about an hour.

Among the Liberty's few drawbacks are its keyboard and pointing stick. The unit's pointing stick is in an odd place, positioned so that it could only be realistically used with your right hand. The Liberty's keyboard is also small, with only 17.5-mm keyspacing.

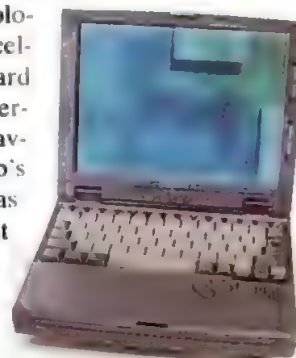
The Colorbook², with a travel weight of 6.6 pounds, is a fair value. It offers a full-size keyboard, a centrally located pointing stick, 8MB of RAM, and a 516MB hard disk. It also came with the same C&T graphics accelerator as the Liberty. Unfortunately, its dual-scan screen appeared washed out; the system also lacked L2 cache.

The Colorbook²'s performance is a decided plus: It posted consistently above-average scores in its value class. And its battery life was among the very best, at 3:05.

Both systems are covered by a one-year parts-and-labor warranty. For an additional \$99 per year Gateway will guarantee 24-hour parts or system replacement.—WPF

Gateway 2000 Inc., North Sioux City, SD; 800-846-4769, 605-232-2000; fax, 605-357-2023.

Circle 469 on reader service card



**Gateway Liberty
DX4/100 Best Buy.**

SUITABILITY TO TASK

ColorBook² DX4/100 Deluxe

Desktop replacement	Good
Road warrior	Good

SUITABILITY TO TASK

Liberty DX4/100 Best Buy

Desktop replacement	Fair
Road warrior	Excellent

SERVICE & RELIABILITY

Gateway 2000 Inc.

Reliability	Average
Repair	Average
Technical support	Better than average
% needing repair	Average

SUITABILITY TO TASK

FutureMate FM309T

Desktop replacement	Excellent
Road warrior	Good

SUITABILITY TO TASK

FutureMate FM559D

Desktop replacement	Fair
Road warrior	Good

and floppy disk drives are also removable; each can be replaced by the same nickel hydride battery, a nice plus.

Unfortunately, the FM559D's WinDrain time was only 1:33. This short life, combined with the 8.8-pound travel weight, means the FM559D makes the most sense if you require its presentation capabilities.

On our benchmark tests, the system performed poorly compared with other multimedia machines, mainly because it lacked L2 cache. Its Disk WinMark 95 score was average, but its Graphics WinMark 95 and Winstone 95 scores were below average.

The 8-pound FM309T has many of the features you would expect to find in a full-featured notebook, including a 90-MHz Pentium CPU and a 10.5-inch



*"Surprise me. Give me more power
than I thought I could get for my money."*



IBM Solution # 111163-J

a.k.a. "Affordable Pentium Technology"

If you're looking for a lot of performance for not a lot of money, consider the new IBM PC 300. Pumped up with a 75 or 90MHz Pentium® chip and 64-bit graphics, it delivers all the speed and functionality you need for off-the-shelf

- 75/90MHz Pentium® processors
- SelectaSystem™ DOS/Windows™ and OS/2® Warp
- 64-bit graphics



- 3-year warranty*
- IBM HelpWare®
- 540/850MB HDD
- PCI/ISA bus architecture
- Fax ID# 3467

FOR MORE DETAILS ON PC 300s, CALL 1 800 772-2227*

or customized applications. And it starts at just \$1825* (monitor not included). Which means you can take on the heavy stuff without getting in over your head. The IBM PC 300. One more reason there is a difference.™



*Entry-level PC Direct price for 75MHz/540MB HDD. Dealer prices and product availability may vary. IBM's Statement of Limited Warranty is available upon request by calling 1 800 772-2227. *In Canada, call 1 800 465-7779. IBM, OS/2 and HelpWare are registered trademarks and SelectaSystem and "There is a difference" are trademarks of International Business Machines Corporation. Pentium is a registered trademark of Intel Corp. Windows is a trademark of Microsoft Corp. ©1995 IBM Corporation.

Hewlett-Packard Co.

HP OmniBook 4000CT

Hewlett-Packard's DX4/100-based HP OmniBook 4000CT, with a street price of \$4,346, is a solid choice for a full-featured notebook as long as performance isn't paramount. The 10.5-inch active-matrix display and the well-designed keyboard and trackball make using the system as comfortable as using any desktop. (The now-familiar miniature mouse, OmniMouse, is reserved for HP's sub-notebooks, not reviewed.)

HP is adding a new member to its full-featured notebook line: the OmniBook 5000. The 5000 will feature a Pentium/90 processor with secondary cache, PCI architecture, a Super VGA screen, hard disks up to 1GB, a lithium ion battery, and built-in SCSI support.



HP OmniBook 4000CT.

The OmniBook, with an 8.1-pound travel weight, posted a 1:58 battery life on our WinDrain test—an average result for its class. You can increase battery life by replacing the floppy disk drive with a second battery.

The OmniBook also has an IrDA-compliant infrared port—HP is one of the vendors that has pioneered infrared communication in PCs—plus a 16-bit stereo sound chip, two speakers, and a built-in microphone. The system provides two PC Card slots and adds ports for an external microphone and headphones. Its 499MB hard disk is removable, although you'll need to take out a single screw. Hewlett-Packard also offers a \$299 port replica for the unit and includes an additional PC Card slot

SUITABILITY TO TASK

HP OmniBook 4000CT

Desktop replacement	Good
Road warrior	Good

SERVICE & RELIABILITY

Hewlett-Packard Co.

Reliability	Better than average
Repair	Average
Technical support	Better than average
% needing repair	Better than average

as well as a SCSI connection.

The system took a hit on our performance tests because it lacks L2 cache. Among full-featured notebooks, the unit posted consistently below-average scores on our Winstone 95, Disk WinMark 95, and Graphics WinMark 95 benchmark tests.

The OmniBook is covered by a three-year parts-and-labor warranty. This warranty includes one year of HP's Express Exchange service, which guarantees 24-hour replacement of the unit or its parts. —WPF

Hewlett-Packard Co., Corvallis, OR; 800-443-1254, 503-715-2004; fax, 503-715-5488.

Circle 470 on reader service card

HyperData Technology Corp.

HyperBook 900A

With a 90-MHz Pentium CPU and 24MB of RAM, the \$5,035 HyperBook 900A is a truly power-packed notebook. Offering good performance for its full-featured category, it is designed to serve as a complete desktop replacement. The HyperBook is packed so full of componentry to support its Pentium processor, however, that there's no space for an internal floppy disk drive.

The HyperBook offers the components you would expect in a full-featured notebook: a fast processor, a 772MB hard disk, a 9.5-inch active-matrix display, and a 16-bit audio subsystem with stereo speakers. It even includes a built-in SCSI port. This unit, built by HyperData, is substantially the same as Maximus Computers' Maximus PowerMax (reviewed elsewhere in this roundup), which uses a Pentium/100 processor.

Because of the amount of Pentium-related hardware inside the HyperBook's case, including a large heat sink and two small fans, the floppy disk drive is external. The case, which features an integrated pointing key in the palm-rest area, employs a modular design; removing the keyboard to get to the memory banks and removing the battery or hard disk are easy tasks.

SUITABILITY TO TASK

HyperBook 900A

Desktop replacement	Good
Road warrior	Fair

In addition to its standard nickel hydride battery, the system came with an external battery (a \$140 option included in the above price) that attaches to the bottom of the unit and can act as a tilt stand. The unit's battery life on our WinDrain test, with the external battery, was a very respectable 2:31.

The unit's travel weight is 9.6 pounds.

The HyperBook posted average scores for its full-featured category



HyperData HyperBook 900A.

on all our Windows-based benchmark tests. One might expect more from a Pentium/90-based system, but this unit lacked L2 cache—a feature found on most other Pentium units in this class—which hindered its performance.

HyperData Technology offers a one-year parts-and-labor warranty with its systems. —RSA

HyperData Technology Corp., Walnut, CA; 800-786-7223, 909-468-2955; fax, 909-468-2961.

Circle 471 on reader service card

IBM Personal Computer Co.

ThinkPad 755CX

ThinkPad 360CSE

ThinkPad 755CD

ThinkPad 701C



IBM Personal Computer Co.'s arsenal of notebooks seems to get bolder and more innovative with each new generation. The full-featured ThinkPad 755CX (\$7,164), the multimedia ThinkPad 755CD (\$6,964), the innovative ThinkPad 701C (\$5,299) subnotebook, and the value-priced ThinkPad 360CSE (\$2,994) are all technically solid machines. But in terms of performance, the competition seems to have surpassed Big Blue.

All the ThinkPads offer the TrackPoint pointing stick, and all except the 701C (equipped with the much-touted expand-

DELL LATITUDE
Dependable Notebooks
With Superior Battery Life



DELL LATITUDE™ XPi P75D
75MHz PENTIUM® PROCESSOR

- ★ 10.4" Dual Scan Color Display
- 8MB RAM (40MB Max RAM)
- ★ 256KB L2 Cache
- 420MB Removable Hard Drive (1.2GB Max)
- ★ Smart Lithium Ion Battery with Advanced Power Management
- 32-bit Local-bus Video, 1MB Video RAM

- 2 Type II/Type III PCMCIA Expansion Slots
- Preloaded Communications Software
- 6.1 Pounds
- Optional Dell Latitude DeskDock™ Available
- 1 Year Warranty*
- 30 Day Money-back Guarantee
- Business Lease: \$111/Mo.
Order Code #800025

**Our New Pentium Chip
Latitude XPi**

\$2999

THE ALTERNATIVE TO DELL'S COAST TO COAST PENTIUM CHIP NOTEBOOK.



If airlines had outlets at every seat, it wouldn't matter so much that most Pentium processor-based notebooks only last an hour or two. But the only outlets are in the restroom. And you can't spend the whole trip in there.

Introducing the Dell® Latitude™ XPi. The first Pentium processor-based notebook that can last take-off to touch-down. Coast to coast.

This thanks to Dell's record-breaking smart Lithium Ion battery and power management technology (not to mention Intel's new LM Pentium chip). In "Cross-Country™ tests" conducted by VeriTest, inc., a leading independent test lab, the Dell Latitude XPi P75 dual scan notebook lasted an average of 4 hours and 40 minutes. That's LA to New York, no problem. Of course, actual battery life will vary depending on the nature of your use and configuration. You might even get more.

Call us now to order your Latitude XPi.

DELL

TO ORDER, CALL

800-765-5785

In Canada,* call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT

Sun 12pm-5pm CT • <http://www.us.dell.com/>

Keycode #04078

The VeriTest Cross-Country v2.0 test simulates typical executive use of Microsoft Office® applications on Microsoft Windows® 3.11. During an average flight, power management was enabled and 4MB RAM was installed. VeriTest Inc. is located in Santa Monica, CA. Offer expires 1/31/95. Promotional pricing is not discountable. *Guarantees available in the U.S. only for registered owners of Dell Latitude systems purchased after 8/8/94. †For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., 2214 W. Braker Lane, Building 3, Austin, TX 78758. ‡Business leasing arranged by Leasing Group, Inc. *Prices and specifications valid in the U.S. only and subject to change without notice. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. ©1995 Dell Computer Corporation. All rights reserved.

SERVICE & RELIABILITY

IBM

Reliability	Better than average
Repair	Better than average
Technical support	Better than average
% needing repair	Average

ing "butterfly" keyboard) have flip-up keyboards that make access to internal components very easy. Except for the 360CSE, all come with brilliant 10.4-inch active-matrix LCDs, 514MB hard disks, and integrated 14.4-Kbps fax modems and infrared ports. The 360CSE came with a 9.5-inch, dual-scan color LCD and a 328MB hard disk (a 14.4-Kbps PC Card modem costs an additional \$180).

With a travel weight of 7 pounds, the 755CX has a Pentium/75 CPU, a 256K L2 cache and, like other 700-series ThinkPads, includes a built-in 16-bit audio system and a full selection of preinstalled software. Despite its Pentium CPU, all of the 755CX's Windows-based test scores were below average. One bright spot was its WinDrain score: With its state-of-the-art lithium ion battery, the unit ran for 2:15.

The 755CD, which has a DX4/100 CPU, includes everything you could want

SUITABILITY TO TASK

ThinkPad 755CX

Desktop replacement	Excellent
Road warrior	Excellent

SUITABILITY TO TASK

ThinkPad 360CSE

Desktop replacement	Fair
Road warrior	Fair

SUITABILITY TO TASK

ThinkPad 755CD

Desktop replacement	Excellent
Road warrior	Good

SUITABILITY TO TASK

ThinkPad 701C

Desktop replacement	Good
Road warrior	Excellent

10.4-inch active-matrix LCDs, 514MB hard disks, and integrated 14.4-Kbps fax modems and infrared ports. The 360CSE came with a 9.5-inch, dual-scan color LCD and a 328MB hard disk (a 14.4-Kbps PC Card modem costs an additional \$180).



IBM ThinkPad 701C.

in a multimedia notebook and offers an unmatched array of components. The removable CD-ROM drive can be swapped for a floppy disk drive, and it has jacks for NTSC video. Its travel weight is an attractive 8.2 pounds. The unit posted below-average Winstone 95, Graphics WinMark 95, and Disk WinMark 95 scores for its class. Its WinDrain score of 1:59 was average.

The DX4/75-based 701C, with a travel weight of 5.1 pounds, sets the

standard for subnotebook design. Its clever folding keyboard spreads to full size when you open it, and its 16-million-color LCD is legible even in bright sun.

The unit has no built-in standard ports, however. It offers just two connectors: a side connector for an external floppy disk drive or parallel-port adapter cord and a rear connector for the MultiPort II expansion unit. The lightweight MultiPort II, included as standard equipment, provides all basic I/O ports and has audio jacks.

The 701C's above-average Graphics WinMark score was one of IBM's few bright spots on our benchmark tests. Again, however, its Disk WinMark score was below average, and its below-average Winstone score was similar to that of a DX2/50-based 701C reviewed in our issue of March 14, 1995. The unit used a nickel cadmium battery—the only unit in this roundup to do so—and lasted just 1:40 on our WinDrain battery test.

The value-priced 360CSE maintains the look and feel of the 700-series ThinkPads, but it uses a 486DX2/50 CPU and lacks a modem and the audio features of its siblings. Its travel weight is just 7 pounds. The unit posted below-average scores for its value class on all Windows-based tests, but its WinDrain score was good, at 2:15.

IBM offers a three-year warranty on the 700-series ThinkPads and a one-year warranty on the 360CSE. (We reviewed the new ThinkPad 755CV in the First Looks section of our July 1995 issue.)—RSA
IBM Personal Computer Co., Somers, NY; 800-426-2968, 914-766-1900.

Circle 472 on reader service card

Maximus Computers Inc.

PowerMax MediaNote

The name that Maximus chose for its high-end notebook—PowerMax—seems appropriate, given that it's the only machine in this roundup to use a 100-MHz Pentium processor. Its performance was very good, and at \$3,459, the PowerMax is priced far lower than many other full-featured entries.

The DX4/100-based Maximus MediaNote is also affordable: Its \$2,859 price

SUITABILITY TO TASK

PowerMax

Desktop replacement	Good
Road warrior	Fair

SUITABILITY TO TASK

MediaNote

Desktop replacement	Good
Road warrior	Fair

makes it one of the least expensive CD-ROM-equipped notebooks that we tested.

The PowerMax is similar to HyperData Technology Corp.'s Pentium/90-based HyperBook 900A, and the MediaNote is similar to

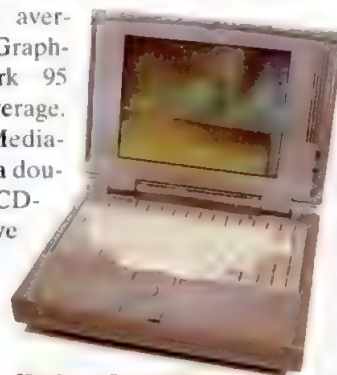
MPC Technologies' MPC CD-Book (both reviewed in this roundup).

The Maximus pair offers an impressive feature set, including 16-bit audio with stereo speakers. The PowerMax also offers a built-in SCSI port and a 9.5-inch active-matrix screen (the MediaNote's screen was a dual-scan model). The unit also included an external, bottom-mounted, nickel hydride battery (\$149, included in the above price, and also available with the MediaNote). The external battery is a welcome addition, because the PowerMax's average WinDrain score of 2:14 was achieved only with its external battery attached.

Even though it used a 100-MHz Pentium, the PowerMax did not outscore all other machines in its category, demonstrating that more than a fast processor is needed to get the best performance. The system lacked L2 cache, which undoubtedly hurt it in this class. On the whole, its scores were nevertheless impressive: Its Winstone 95 and Disk WinMark 95 scores were above average, and its Graphics WinMark 95 score was average.

The MediaNote offers a double-speed CD-ROM drive under a flip-up keyboard and a button-topped pointing stick integrated into the right side of its Spacebar.

The MediaNote posted an average Winstone score; its Disk WinMark score was one of the best in its class, but its Graphics WinMark score was below average. The



Maximus PowerMax.

Hit the road, Jack.



Now there's an easier way to stay in touch when you're out on the road.

Simple Technology's 28.8 Communicator combines advanced modem features normally found in separate PC Cards, like voice recording and cellular capability, with true plug n' play compatibility.

Unlike some other PC Cards, we use only industry standard software to assure plug n' play compatibility. So you never have to restart your computer when swapping cards.



- ✓ Fast 28,800 bps, V.34 send/receive
- ✓ 14,400 bps fax, Class 1, 2, Group 3
- ✓ Cellular ready, MNP10-EC
- ✓ Simple installation—up and running in seconds
- ✓ Automatic voice recording
- ✓ True Plug n' Play ease of use
- ✓ Ultrasonically welded for durability



We bundle QuickLink™ Message Center software for Windows® to give you full control over data, fax and voice telecommunications. And our user-friendly Simple Installation Guide will have you up and running in less than a minute.

Call **1-800-4-SIMPLE** today for a dealer near you or for information on our complete line of PC Card and memory upgrade products.

For easy to use, plug n' play PC Cards, the solution is Simple.

PLUG & PLAY
PC CARDS



14.4
Communicator



SCSI II



130MB



10Base-T
Ethernet



Simple
TECHNOLOGY
INCORPORATED

Memory and PCMCIA Solutions™

1-800-4-SIMPLE
1-800-474-6753

For instant information contact our faxback at **1-800-429-5626 x500**

30 Day Money Back Guarantee program good only for end users at participating retail locations. Returns require RMA number. Call first before returning. Other restrictions may apply. See retailer for details.
©1995 Simple Technology. Simple Technology and the Simple Technology logo are trademarks of Simple Technology, Inc. Other brands and names are the property of their respective owners.

CIRCLE 246 ON READER SERVICE CARD

MediaNote's battery lasted just 1:47.

Both units use external floppy disk drives, but for different reasons: the MediaNote because of the built-in CD-ROM drive, and the PowerMax because of the extra support circuitry and large heat sink needed for the Pentium/100. Maximus says that 10.4-inch screens are now standard for the two systems at no additional cost.

Maximus offers a one-year warranty; on-site service is \$49 for one year.—**RSA Maximus Computers Inc., Monrovia, CA; 800-888-6294, 818-305-5925; fax, 818-357-9140.**

Circle 473 on reader service card

MaxTech Corp.

YesBook X-740T YesBook X-740C

The strength of MaxTech Corp.'s two portables lies in the modularity of their components. The \$3,695 YesBook X-740T, a full-featured system, and the \$2,095 YesBook X-740C, a value system, also offer good prices, although their performance was marginal.

These notebooks use identical modular cases; each unit's hard disk, floppy disk drive, and battery are all easily removable with the flip of a latch. Though these systems don't offer standard audio, each unit's floppy disk drive can be swapped for a sound module (\$189) that

integrates 16-bit stereo audio and a connector to attach the floppy disk drive externally. Alternatively, you can replace the floppy disk drive with a second battery (\$149). You can also exchange the trackball for a pointing stick for an additional \$50. Both

systems' full-size keyboards are removable and can be replaced with one of ten foreign-language keyboards.

Areas where these systems differ are screen size and technology, as well as processor type. While the X-740T runs on a DX4/100 CPU and has a 9.5-inch active-matrix screen, the X-740C uses a

SUITABILITY TO TASK

YesBook X-740T

Desktop replacement	Good
Road warrior	Fair

SUITABILITY TO TASK

YesBook X-740C

Desktop replacement	Fair
Road warrior	Fair

WinMark 95 scores. Thanks to Microsoft Windows for Workgroups, both posted average Disk WinMark 95 scores. On our WinDrain battery test, the X-740T ran for 2:11, while the X-740C lasted 1:40.

MaxTech Corp. offers a one-year parts-and-labor warranty.—**RSA**

MaxTech Corp., Rockaway, NJ; 800-936-7629, 201-586-3008; fax, 201-586-3308.

Circle 474 on reader service card

Micro Express

Micro Express NP92DX4



At \$2,495, the Micro Express NP92DX4 is aggressively priced for a 100-MHz DX4 notebook and has many of the features normally found in full-featured systems. Its aggressive price and solid features earned it an Editors' Choice designation. Though not the fastest DX4-based machine, it was competitive within its value category.

The NP92DX4, which includes a 503MB hard disk and a 16-bit audio subsystem with stereo input and output jacks, is aimed at business users who need CPU power and minimal multimedia functions. The unit's 10.3-inch dual-scan passive color screen is bright but showed streaking in Microsoft Windows.

A welcome convenience of the NP92DX4, which has an 8-pound travel weight, is its two small hot-swappable nickel hydride batteries. Together, the pair yielded an average WinDrain time of just under 2 hours.

The unit has a

486DX2/66 chip and has a 10.3-inch dual-scan screen.

The MaxTech systems were only fair performers within their respective classes. Both machines produced below-average Winstone 95 and Graphics

large trackball embedded in the wrist area and an extratall PC Card slot that can accommodate both a Type II and a Type III device at the same time. The NP92DX4, built by Nan Tan Computer Co. of Taiwan, is similar DFI's MediaBook 5110T (reviewed earlier in this roundup).

The NP92DX4 was for the most part a good performer. Its Winstone 95 score was just above the value group's average, while its Graphics WinMark 95 score was average. Its Disk WinMark 95 score was below average, however. Because the system came loaded with Microsoft Windows 3.11 instead of Microsoft Windows for Workgroups, it suffered a performance penalty on our Disk WinMark tests, especially when compared with other DX4-based value units.

The NP92DX4 can be used with a large, \$395 Micro Express multimedia docking station, which includes a quad-speed CD-ROM drive and an available drive bay, front-mounted stereo speakers, two 16-bit ISA slots, two VL-Bus slots, and standard I/O ports.

Micro Express offers a two-year parts-and-labor warranty. A year of on-site service is \$50.—**RSA**

Micro Express, Santa Ana, CA; 800-989-9900, 714-852-1400; fax, 714-852-1225.

Circle 475 on reader service card

MidWest Micro

SoundBook Plus SoundBook II

MidWest Micro's \$3,599 SoundBook II and \$4,799 SoundBook Plus are both feature-rich machines that are also strong performers. The DX4/100-based SoundBook II has a modular design that can accommodate many options but is priced higher than many systems in the value category. The full-featured SoundBook Plus is not as flexible as its sibling but still has a lot to offer.

The MidWest Micro units each feature



Micro Express
NP92DX4



MaxTech YesBook
X-740T

The New ZEOS[®] Pantera™...

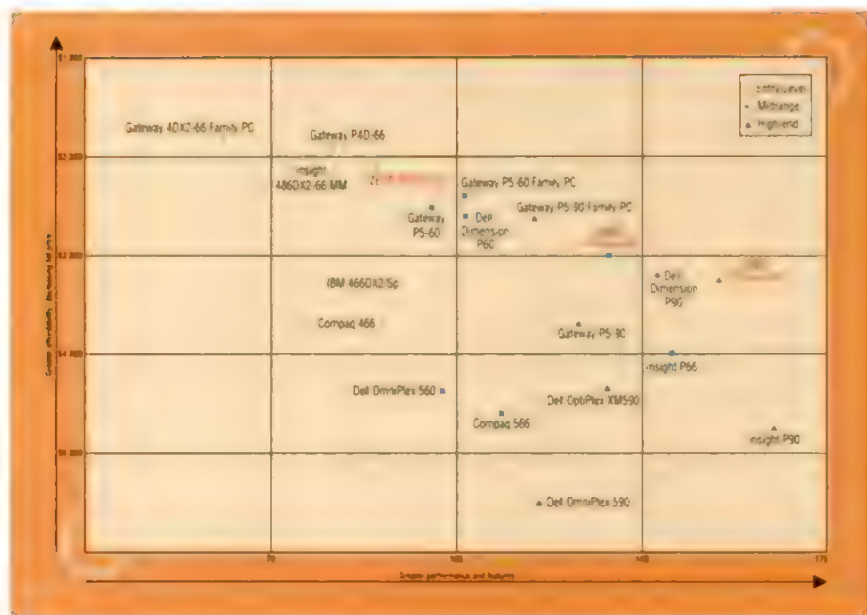


We've
Turned On
The Afterburners!





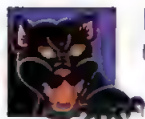
The Best...



As *PC Magazine* and others report time after time, review after review, the **ZEOS** Pantera is your best value with its outstanding performance and incredibly low price.

Just Got Better!

Now, with these latest value-enhancing technologies, your **ZEOS Pantera Pentium** is even further in the lead.



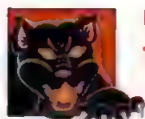
EDO DRAM:

Memory access is now up to 33% faster!



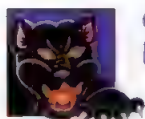
Synchronous Burst SRAM Cache:

Cached data can now be accessed at up to double the usual speed!



Upgradability to the P6-based OverDrive Processor:

You won't get caught short on cat-power with the Pantera. Upgradability to a future P6-based CPU is built-in!



On-Board PCI Local Bus Ethernet and SCSI:

Pantera Pentium systems allow the addition of local bus SCSI and networking right on the motherboard. That's lower cost and more expandability for you—but you can't get it from the other guys!



6 SIMM Slots: Expand all the way to 384MB! Plus, Pantera Pentium configurations all the way up to 128MB RAM leave free sockets for upgrading memory in the future. The others guys usually make you throw memory away before you can add more!



Pentium-66
April 12, 1994
DX4-100
June 26, 1994



Pentium-60
April 1994
Pentium-90
August 1994



486DX2-66
January 1994
February 1994
March 1994
June 1994
December 1994
January 1995
February 1995
March 1995
April 1995

DX4-100
October 1994
November 1994
December 1994
Pentium-60
December 1994
January 1995
February 1995
April 1995

Pentium-66
June 1994
July 1994
August 1994
September 1994
Pentium-90
August 1994
September 1994
October 1994
November 1994
January 1995
February 1995



Pentium-66
May 1994
Pentium-90
February 1995



Pentium-66
June 1994
Pentium-90
August 1994



Pentium-90
November 1994



Pentium-90
May 1995

Package 1	Package 2	Package 3	Package 4
486DX2-66 \$1295	486DX2-66 CNI \$1595	486DX2-66 CNI \$2095	486DX2-66 \$2495
DX4-100 \$1445	DX4-100 \$1745	DX4-100 \$2245	DX4-100 \$2645
Pentium-75 \$1645	Pentium-75 CNI \$1945	Pentium-75 CNI \$2445	Pentium-75 \$2845
Pentium-90 \$1745	Pentium-90 \$2045	Pentium-90 CNI \$2545	Pentium-90 \$2945
Pentium-100 \$1895	Pentium-100 \$2195	Pentium-100 \$2695	Pentium-100 CNI \$3095
Pentium-120 \$2145	Pentium-120 \$2445	Pentium-120 \$2945	Pentium-120 CNI \$3345
Pentium-133 \$2395	Pentium-133 \$2695	Pentium-133 \$3195	Pentium-133 \$3595

- 4MB RAM (Pentiums include EDO RAM)
- **528MB** local bus EIDE hard drive, 14ms
- 3.5" 1.44MB floppy disk drive
- **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM
- **ZEOS 14"** 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch
- Six-bay desktop case with two cooling fans
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11
- **MS Works**

- 8MB RAM (Pentiums include EDO RAM)
- **850MB** local bus EIDE hard drive, 11ms
- **4X CD-ROM** drive and 3.5" 1.44MB floppy drive
- **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM
- **ZEOS 14"** 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch
- Six-bay desktop case with two cooling fans
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11
- **MS Works Multimedia CD**

- 16MB RAM (Pentiums include EDO RAM)
- **1GB** local bus EIDE hard drive, 12ms
- **4X CD-ROM** drive and 3.5" 1.44MB floppy drive
- **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM
- **ZEOS 15"** 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch
- Six-bay desktop case with two cooling fans
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11
- **MS Office Pro & Bookshelf CD**

- 24MB RAM (Pentiums include EDO RAM)
- **1.2GB** local bus EIDE hard drive, 10ms
- **4X CD-ROM** drive and 3.5" 1.44MB floppy drive
- **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM
- **ZEOS 15"** 1024 x 768 non-interlaced SVGA color monitor, .28mm dot pitch
- Six-bay desktop case with two cooling fans
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11
- **MS Office Pro & Bookshelf CD**

Included With Every ZEOS Pantera:

- Genuine Intel® Processor. ZIF socket for easy upgrading.
- Diamond Stealth PCI local bus color graphics card with 1MB DRAM, upgradable to 2MB DRAM.
- Flash BIOS.
- Two high-speed serial ports and one enhanced parallel port on the motherboard.
- Slots: Three PCI & 4 ISA (486), 3 PCI & 5 ISA (Pentium).
- ZEOS 101-key space-saving keyboard.
- 200 watt power supply with built-in surge suppressor. Switchable between 115/230V.
- FCC Certified Class B; UL Listed.
- Complete ZEOS Customer Satisfaction Package.

486 & DX4:

- Upgradable to Pentium™ OverDrive™ CPU.
- RAM expandable to 128MB.
- EPA Energy Star compliant.

Pentium™:

- Upgradable to future P6-based OverDrive CPU.
- 6 SIMM slots for low-cost memory upgrading. EDO RAM expandable to 384MB.
- On-board PCI local bus Fast SCSI-2 and Ethernet LAN options.
- EPA Energy Star compliant (75, 90 & 100).

Pentium-133
Shipping
Now!

Favorite Options

7-Bay Mini-tower Case Upgrade	Free
10-Bay Vertical Case Upgrade	\$95
1GB to 1.2GB Hard Drive Upgrade	\$95
528MB to 1GB HDD Upgrade ..	\$150
1MB to 2MB Video DRAM Upgrade	\$59
Diamond Stealth 64 Video PCI Graphics Card with 2MB VRAM	
Fastest 64-bit accelerated video.....	\$249

Upgrade from a 14" to a 15" Monitor	ZEOS SVGA NI, 1024 x 768, flat screen	\$95
Upgrade from a 15" to a 17" Monitor	ZEOS SVGA NI, 1280 x 1024, flat screen	\$295
Internal 14,000 bps V.32 bis Modem with 14,400 bps Send/Receive Fax		\$79
Internal 28,800 bps V.34 bis Modem with 14,400 bps Send/Receive Fax		\$199
SCSI Controller Chip	For on-board SCSI. Includes drivers	\$49

ZNIX EtherAction™ 32	32-bit PCI Ethernet LAN adapter. Includes 10Base5, 10Base2 and 10BaseT connections	\$129
Front Drive Bay PCMCIA SwapBox	Installs into 3.5" drive bay. 2 Type II, or 1 Type III and 1 Type II	\$179
T1000 Internal Tape Backup	400 to 800MB (with compression), includes backup software.....	\$199
Multimedia Upgrade	Sound card and stereo speakers	\$128

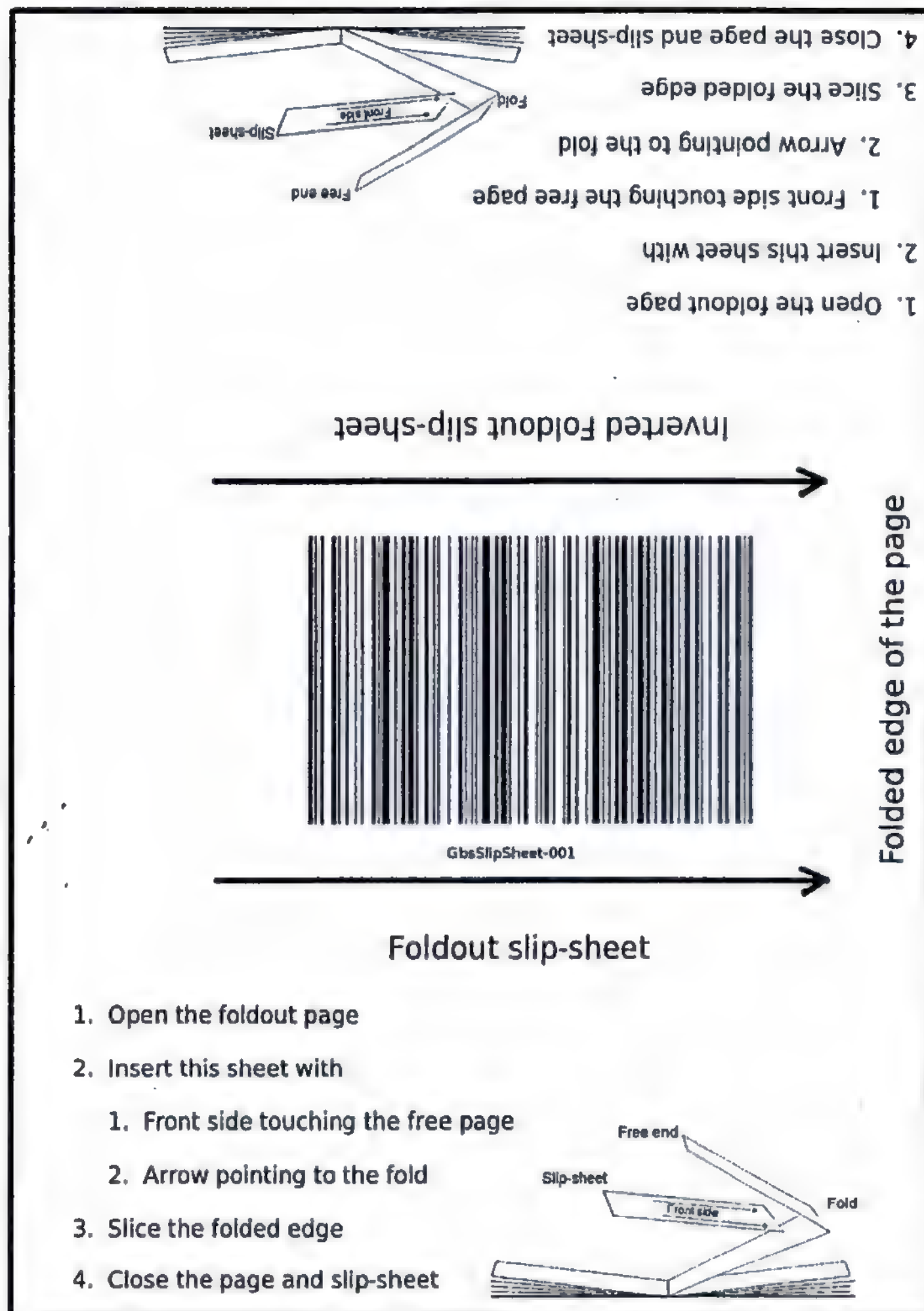
Many other affordable upgrades and options available. Call for details!

CNI — We can ship today! See back for more packages.
Fax Orders: 800-362-1205 or 612-362-1205. Phone Orders:
Outside U.S. and Canada: 612-362-1212. Government:
800-245-2449. ZEOS Information Systems, Inc.
GSA#GS00K94AGS5176.

800-554-7172

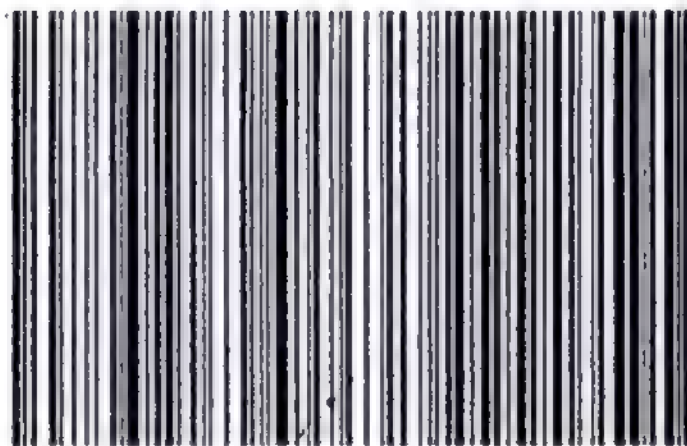
24 Hours a Day
365 Days a Year





1. Follow instructions on the other side

Inverted Back



Gbs5lipBack-0018

Back

1. Follow instructions on the other side

Pantera™ Strikes Again!

Keeping You In Front

The ZEOS Pantera, continuously rated the #1 value in PCs today, is flying ahead of the competition. Now ZEOS brings you all the features that have set the Pantera apart in the past *plus* new features that will keep you ahead of the pack in the future!

At ZEOS, our philosophy is to make sure that you, our customer, get the best of everything. And that starts with performance. The heart of the

Pantera is a ZEOS-designed motherboard featuring PCI local bus expansion, on-board Enhanced IDE drive interfaces and support for SRAM caches up to 512K.

Already called "Overall performance leaders" by

 *PC Magazine*, the Pantera Pentium line is now boosted even further with the addition of EDO DRAM, synchronous burst SRAM cache options and CPU choices all the way to the brand new 133MHz Pentium processor. In plain English, this all means that we've turned on the afterburners—giving you performance unlike anything you've seen before!

Beyond great performance, giving you the best also means protecting your investment. To ensure that your new ZEOS Pantera will serve you well for years to come, we build in more reliability, expandability and upgradability than anyone else anywhere.

For starters, all Pantera systems provide you with CPU upgradability—486s can be upgraded to the Pentium OverDrive processor and Pentium systems can be upgraded to the future P6-based OverDrive Processor. On Pentium-based systems, we also give you *six* memory sockets instead of the usual four. That means more room to grow—without having to throw away perfectly good memory when it's time to upgrade. Pantera Pentiums

also include on-board PCI local bus SCSI and Ethernet options. On-board means lower cost to you, and it also means you don't have to use expansion slots for adding these popular features.

And how about the power to run all these goodies? Believe it or not, most companies are now building in small power supplies of 150 watts or less! That's great for reducing *their* costs, but it sure doesn't do much for *you*. Pantera power

supplies are 200 watts *standard* and they're energy efficient—most Panteras are EPA Energy Star compliant, meaning they can power down and use less energy.



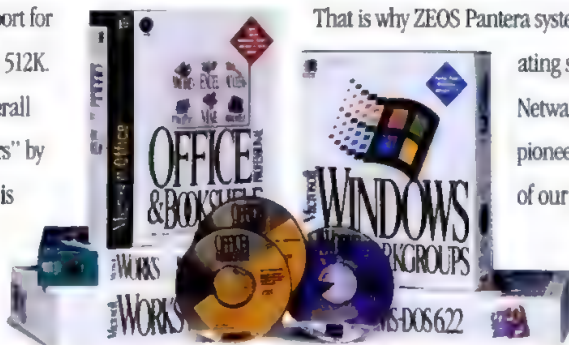
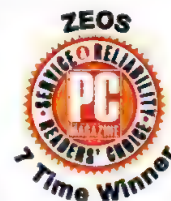
The bottom line is that virtually no one else gives you any of these features to protect your investment. At ZEOS we give you them *all*!

More Than Great Hardware

In addition to the latest features, you need your new system to arrive promptly and you need it to work in *your* environment when you get it. That is why ZEOS Pantera systems are compatible with every major operating system on the market including Win NT, Netware, Unix and OS/2. That is also why we pioneered our *Computers Now*® program—many of our most popular configurations can be

shipped the *very day you order* (even custom-built systems can be shipped in about a week). You could be taking delivery of your new Pantera tomorrow!

And after your purchase, we'll be here. ZEOS was the first to provide 24 hour-per-day, 365 day-per-year



Free Microsoft® Software!

In addition to MS-DOS and Windows for Workgroups, ZEOS also gives you today's market leading applications software, loaded on your hard drive and ready to run, absolutely free! Microsoft® Works or Microsoft® Office Professional & Bookshelf are yours with your new ZEOS Pantera.

toll-free technical assistance, and it's the best there is. Add to that our easy accessibility through the major on-line services and through our automated fax-back system, and you can see we support you like no one else.

Unbeatable Value

The hottest performance for today and for tomorrow, compatibility, reliability, bundled software, the best service in the industry and incredible prices that'll leave you amazed at how much you get for so little. As *PC/Computing* said, the Pantera "... is a deal you simply can't pass up." So call your ZEOS Systems Consultant now at 800-554-7172. It's the best purchase decision you'll ever make.

Don't miss the biggest sale of the day for the best restaurants!



Windows **Pentium-75**
\$2545

- | | |
|--------------------|---------------|
| Pentium-90 | \$2745 |
| Pentium-100 | \$2895 |
| Pentium-120 | \$3145 |

Hottest:

- ▶ 16MB EDO RAM, 256K synchronous

- SRAM cache
- 1GB local bus EIDE hard drive
- 4X CD-ROM drive, 3.5" 14MB FDD
- Diamond Stealth 64 Video PCI
- local bus graphics card/2MB VRAM
- 15" SVGA color monitor
- 6-bay desktop case (Pentium-75)
- 10-bay vertical case (Pentium 90, 100 & 120)
- MS-DOS, Windows for Workgroups
- Microsoft Mouse
- MS Office Pro & Bookshelf CD



Pentium-100	\$3795
Pentium-120	\$4045

Pentium-133 \$429!
Best MM Supreme

- 24MB EDO RAM, 256K synchronous SRAM cache
- 1.2GB local bus EIDE hard drive
- 4X CD-ROM drive, 3.5" 1.44MB FDI
- Sound Blaster® 16 sound card, high power stereo speakers w/subwoofer
- Diamond Stealth 64 Video PCI local bus graphics card/2MB VRAM
- 17" SVGA color monitor
- 10-bay vertical case
- MS-DOS, Windows for Workgroups
- Microsoft Mouse
- MS Office Pro & Bookshelf CD

- 8MB RAM, 128K SRAM cache
- 528MB hard drive

- 3.5" 1.44MB floppy drive
- VESA local bus SVGA color video
- 14" SVGA color monitor
- 4-bay desktop case
- MS-DOS, Windows for Workgroups
- Microsoft Mouse
- MS Works

1 Choose the ZEOS system package you want. (A sampling of our *Computers Now!*®—**CNI**—packages is shown at left.)

- 2** For same-day shipping, call ZEOS at 800-554-7172 before 1 p.m. Central Time, Monday-Friday.
- 3** Upon credit approval we'll ship your system *the same day you order!*

If we accept your order for immediate shipment and fail to ship your system under the conditions outlined, we will ship it *at our expense* as soon as it is ready.*

We can upgrade your *Com-*
puters Now! desktop or vertical
system with a larger monitor—and
still ship it the same day you order!*

800-554-7172
24 Hours
a Day

Fax Orders: 800-362-1205 or 612-362-1205 Phone Orders:
Outside U.S. and Canada: 612-362-1212 Government
800-245-2449 ZEUS Information Systems, Inc. GSM
G800K94AGSS176 Purchase Orders, MasterCard, VISA,
Am Ex, Discover, Z-Card, COD and leasing programs.

[illegible]

CIRCLE 155 ON READER SERVICE CARD

an IrDA-compliant IR transceiver, 16-bit stereo sound, two internal stereo speakers, and two Type II PC Card slots (which together can take one Type III device). A 14.4-Kbps PC Card fax modem was also included with the SoundBook Plus and is a \$129 option for the SoundBook II.

The SoundBook II ships with an internal floppy disk drive that can be swapped with the AC adapter. The system's travel weight is 6.9 pounds. MidWest Micro offers additional "Personality Modules" to fit this space, including a second battery, a second hard disk, and a 14.4-Kbps telephony-enabled fax modem—even a SCSI adapter (for use with an external CD-ROM drive). This unit uses a touchpad and features a 10.5-inch active-matrix display.

The SoundBook II came loaded with 12MB of RAM, a 516MB hard disk, and 128K of L2 cache. It was a strong performer in the value category, garnering top-five scores on all Windows-based benchmark tests.

The SoundBook Plus features a bright 10.4-inch active-matrix display and an integrated pointing stick. Outfitted for the

Drain test, the SoundBook II lasted only 1:06, while the SoundBook Plus stayed active for 1:51.

MidWest Micro preinstalls Lotus Organizer and Microsoft Works on both systems. Both units are covered by a three-year parts-and-labor warranty. On-site service is not available, although MidWest Micro does have a 24-hour BBS.—*Margaret Piemonte*

MidWest Micro, Fletcher, OH; 800-728-8582, 513-368-2309; fax, 800-562-6622.

Circle 476 on reader service card

MPC Technologies Inc.

MPC TouchNote MPC CD-Book

MPC Technologies' MPC CD-Book is a DX4/100-based multimedia unit that, at \$2,998, is reasonably low-priced. Likewise, the MPC TouchNote, a DX4/75-based value offering, is inexpensive at \$2,149. Both units are also lighter than one might expect given the features they offer; for the most part, the units were lacking only in the performance arena.

The CD-Book has a double-speed Philips CD-ROM drive beneath the keyboard; a latch allows easy access.

The two built-in stereo speakers and 16-bit sound enhance multimedia playback and provide a crisp sound. Like most systems with CD-ROM drives, the CD-Book does not have a built-in floppy disk drive, but its travel weight of 7.9 pounds makes it one of the lightest units in its category. MPC bundles 11 CD titles plus its CD-based user manual with the system.

The CD-Book is similar to Maximus Computers' MediaNote (reviewed elsewhere in this roundup), which was the only other system in the multimedia category with a 9.5-inch dual-scan screen.

The TouchNote, which has a 7.3-pound travel weight, uses a smart nickel hydride battery. Unlike the CD-Book, the TouchNote has just one speaker, which sounds only a little better than a standard computer speaker. Luckily, it also has a speaker-out port. You can hook

up an external monitor and keyboard, but the port is shared, requiring the provided dongle for simultaneous connections.

The CD-Book's Graphics WinMark 95 score fell below the average for multimedia units, due in part to its Chips & Technologies 65540 chip set (the top finishers on this test used C&T's newer 65545 chip set). Its Winstone 95 and Disk WinMark 95 scores, however, were both average. This unit's nickel hydride battery lasted only 1:28 on our WinDrain test—one of the worst battery scores for its class.

Like the CD-Book, the TouchNote fell short in performance. Its Winstone and Graphics WinMark scores were below the average for its class. Using a nickel hydride battery, the TouchNote produced an above-average WinDrain score of 2:34.

MPC provides a one-year warranty with both the TouchNote and the CD-Book.—*MP*

MPC Technologies Inc., Santa Ana, CA; 800-672-9960, 714-724-9000; fax, 714-724-9648.

Circle 477 on reader service card

NEC Technologies Inc.

Versa P/75 Versa V/50

NEC Technologies' notebooks manage to combine quality components with thoughtful design. The \$5,974 full-featured NEC Versa P/75 is aimed toward power users who want it all, including a Super VGA display; the \$3,924 NEC Versa V/50 is NEC's well-stocked value entry. Both have different performance trade-offs, however: The P/75 did very well on our benchmark tests but had a below-average battery life; the V/50 had good battery life but poor performance.

The standout feature of the Pentium/75-based P/75 is its crisp 10.4-inch active-matrix screen,

SUITABILITY TO TASK

MPC TouchNote

Desktop replacement	Fair
Road warrior	Good

SUITABILITY TO TASK

MPC CD-Book

Desktop replacement	Good
Road warrior	Fair



MidWest Micro SoundBook II

SUITABILITY TO TASK

SoundBook Plus

Desktop replacement	Excellent
Road warrior	Good

SUITABILITY TO TASK

SoundBook II

Desktop replacement	Excellent
Road warrior	Good

SERVICE & RELIABILITY

MidWest Micro

Reliability	Average
Repair	Average
Technical support	Worse than average
% needing repair	Worse than average



MPC CD-Book

YOUR WINDOW OF OPPORTUNITY HAS OPENED... ACT NOW !!

**10.4"
Active
Matrix
Color**



**Powerful
Intel486™
DX4/100
Processor**

EzBook™ & WINDOWS™ \$2999*

CTX gives you features unheard of below \$3,000*. Such as an extra-large, 10.4" active matrix color screen, with a super-fast DX4/100 processor.

Next, we add a 420MB Hard Disk with 8MB of RAM and **BINGO!**



CTX EzBOOK

- ▲ 10.4" TFT ACTIVE MATRIX COLOR
- ▲ Intel486™ DX4/100 Processor
- ▲ 420MB Hard Disk
- ▲ 8 MB of RAM, upgradable to 32
- ▲ EzGlide Touch Pad
- ▲ VL Local Bus, graphics acceleration
- ▲ 16-Bit Sound Blaster™ Compatible
- ▲ Built-in speaker and mic
- ▲ PCMCIA slots type II & III
- ▲ Two-year limited warranty
- ▲ Toll-free technical support
- ▲ DOS and WINDOWS



You're all set to run WINDOWS™ 95†.

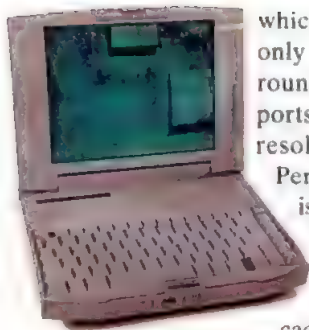
When you add all these great features, together, with a 2-year warranty and toll-free support, it adds up to one thing... More For Less.



Choice of the Pros

USA Headquarters 909-595-6146, Eastern Region 201-646-0707, Midwestern Region 708-285-0202, Southern Region 404-729-8909
FasFax 818-837-4341, 026, Document 458.

©1995 CTX International, Inc. All brand names are trademarks of their respective owners. Images are simulated. * Estimated Street Selling Price.† WINDOWS™ 95 will be available after the official release date from Microsoft, please check with your authorized distributor/reseller for exact dates, availability, and pricing. PCM/8/95
CIRCLE 329 ON READER SERVICE CARD



NEC Versa P/75.

which is one of only five in this roundup that supports 800-by-600 resolution. The Pentium/75 CPU is complemented by 256K of secondary processor cache and a 772MB IDE hard disk. All its Win-

dows-based benchmark test scores were above average.

The P/75's travel weight came in at 8.6 pounds—about average for the full-featured class—but its WinDrain test score was a mere 1:28. You can increase battery life by swapping out the floppy disk drive for a second battery. AT&T's Globalyst 250P is a similar unit that is also reviewed in this roundup.

The V/50 features a 9.5-inch active-matrix screen, a 514MB hard disk, 16MB of RAM, and a 486DX2/50 processor. The machine has an 8.2-pound travel weight and its nickel hydride battery lasted a respectable 2:15 on our WinDrain test. You can also replace the floppy disk drive in the V/50 with a second battery.

Despite having 16MB of RAM (most other value notebooks came equipped with 8MB of memory), the V/50 was a below-average performer in its class. The absence of L2 cache and the use of a slow

486DX2/50 CPU—along with the choice of Microsoft Windows 3.1 rather than Microsoft Windows for Workgroups—are the culprits.

Both machines come with an on-line registration program and a program group called NEC Information, which features the Versa User's Guide and technical-support numbers. The P/75 also includes a handy list of travel essentials.

Other design pluses include covers over the ports on the back that slide into the notebook to prevent accidental breakage.

Each machine offers one Type III PC Card slot (usable as two Type II slots). You can also get a \$94 port replicator or the \$629 Docking Station II—which includes three drive bays, two ISA slots, and audio ports—for either unit.

NEC supports these notebooks with a three-year warranty on parts and labor, which includes one year of UltraCare 24-hour parts-replacement service.—*Mary E. Behr*

NEC Technologies Inc., *Boxborough, MA; 800-632-8377; fax, 800-366-0476.*

Circle 478 on reader service card

Novacor Inc.

Nova OpenNote

Novacor's Nova OpenNote, with a \$1,999 list price and a street price of \$1,875, is a good no-frills system for those on a tight budget. Though the OpenNote has no trouble tackling a word processing or spreadsheet job, its below-average test scores confirm that it will not suffice for graphics- or computing-intensive applications.

Kiwi Computer manufactures the unit, which is also sold by Wedge Technology as the ShowBook EL (reviewed elsewhere in this roundup). Novacor also introduced two new notebook lines after our testing deadline: the Nova 9400 sound-equipped notebooks and the Nova 9800, a high-end Pentium line.

The features of the OpenNote are passable but not ideal. The unit comes with a 9.5-inch dual-scan display, a small built-in trackball, and a smallish 324MB hard disk.

The notebook has one Type II PC Card slot, but it is designed so that a card inserted in the slot sticks out about an inch. This slot lacks an eject button, making it difficult to remove cards.

Like the Wedge ShowBook EL, the OpenNote performed poorly across our benchmark tests; the unit had a last-place Winstone 95 score and a Graphics Win-

Mark 95 score of 1.0. Its Cyrix Cx486DX2-66 CPU (upgradable to an Intel or AMD DX4/100) is not the sole reason for the notebook's poor performance. It also uses a Chips & Technologies 65530 graphics

SUITABILITY TO TASK

Nova OpenNote

Desktop replacement	Poor
Road warrior	Fair

chip set that dates back to 1992 and Microsoft Windows 3.1, which unlike Microsoft Windows for Workgroups

does not support 32-bit file cache.

Novacor's notebook redeemed itself with a respectable 2:07 battery life on our WinDrain test. This tops the Wedge ShowBook EL's time by about half an hour. The OpenNote uses a nickel hydride battery that trickle-charges while the system is running.

Novacor backs the OpenNote with a one-year parts-and-labor warranty.—*Jodi L. Wynblatt*

Novacor Inc., *San Jose, CA; 800-486-6682, 408-441-6500; fax, 408-441-6811.*

Circle 479 on reader service card

Panasonic Personal Computer Co.

Panasonic V41

The Panasonic V41 multimedia notebook provides strong performance, long battery life, and all the features needed to give great multimedia presentations. Unfortunately, this \$7,399 Pentium/75-based system is also the most expensive and heaviest notebook in this roundup. Panasonic also sells the V21 notebook (not reviewed), which can accommodate an optional CD-ROM drive that reads nonstandard 3.5-inch CDs.

The V41's crisp 10.5-inch active-matrix color display is supported by one of the best graphics subsystems in the roundup. Using a VL-Bus interface, its Chips & Technologies 65545 graphics chip set propelled the V41 into first place on the Graphics WinMark 95 suite among the multimedia notebooks.

The V41 also posted an above-average Winstone 95 score in its category. On the other hand, its Disk Win-

SUITABILITY TO TASK

Panasonic V41

Desktop replacement	Good
Road warrior	Fair



Novacor Nova OpenNote.

SUITABILITY TO TASK

Versa P/75

Desktop replacement	Excellent
Road warrior	Good

SUITABILITY TO TASK

Versa V/50

Desktop replacement	Fair
Road warrior	Fair

SERVICE & RELIABILITY

NEC Technologies Inc.

Reliability	Better than average
Repair	Average
Technical support	Average
% needing repair	Better than average

How Fast Do You Want to Go?



Introducing NEW
Austin PowerPLUS™
Desktop Systems:

PowerPLUS 100

PC Magazine Editors' Choice

- 100MHz Intel® Pentium® Processor
- 256KB Pipeline Burst L2 Cache
- 4X IDE CD-ROM, 16-Bit Audio Card, and Stereo Speakers
- 64-Bit PCI Video Accelerator - 2MB
- 3.5" 1.44MB Diskette Drive
- MS DOS 6.22, Windows for Workgroups 3.11
- 101-Key Keyboard & MS Mouse
- Energy-Star Compliant
- Desktop or Mini-Tower Chassis
- Three-Year Parts & Labor Warranty
- One-Year On-Site Service

A New Value Equation:

We've rewritten the book on value, not just because we offer low prices on the hottest desktop and portable PC systems, but also because with our technical support and customer service are a cut or two above the competition.

A PC with all the extras. . . Once you've chosen your system, we'll help you maximize your productivity with the most popular peripherals and software that transform a basic computer into a full-featured electronic office. We know that your work demands more from you. That's why we want you to expect more from us.



Order the Editors' Choice

It's good to know that, whether your criteria emphasize value or performance, Austin offers you a choice of award-winning Pentium technology PCs. Out of over 100 systems reviewed from 53 companies, two of Austin's PowerPLUS™ systems: the **PowerPLUS 75** and the **PowerPLUS 100** were awarded the **Editors' Choice** by *PC Magazine*. A third system – the **PowerPLUS 120** – won an honorable mention.

Creativity is the Austin Edge

These *PC Magazine* awards – which we won over companies like Compaq, Gateway, Micron and Dell – confirm Austin's status as an acknowledged leader in value and performance.

When you factor in Austin's extreme attitude about service, you have a winning equation. When you select Austin and IPC Technologies, you know our systems aren't just faster. *They're definitely better than the competition.*

Business Multimedia
with Microsoft Office
Standard 4.2 Pre-installed

\$2,899

- 16MB Extended Data Output (EDO) RAM
- 850MB Enhanced IDE Hard Drive
- 15" 28 NI Monitor
- **Microsoft Office Standard 4.2 Bundle:** Pre-Installed Excel 5.0, Word 6.0, PowerPoint 4.0, Mail 3.2
- **Business Lease:** \$111 / month

Ultimate Multimedia
with Microsoft Office
Professional 4.3 Pre-installed

\$3,399

- 16MB Extended Data Output (EDO) RAM
- 1.275GB Enhanced IDE Hard Drive
- 17" 26 NI SVGA monitor
- **Microsoft Office Professional 4.3 Bundle:** Pre-Installed Excel 5.0, Word 6.0, PowerPoint 4.0, Mail 3.2, Access, Bookshelf '94, Office Assistant
- **Business Lease:** \$122 / month

NEW

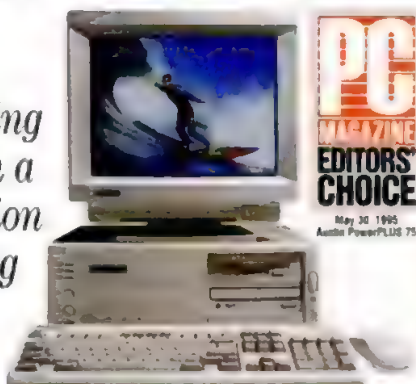
Order above systems with:

120MHz Pentium Processor **\$200**
133MHz Pentium Processor **\$320**

Accelerate to a New Level with Austin PowerPLUS Performance!

Call Us Today and Compare!
Experience the Austin Difference!

Award-Winning Systems with a New Generation of Processing Power.



PowerPLUS 75

PC MAGAZINE EDITORS' CHOICE

- 75MHz Intel Pentium Processor
- 8MB RAM
- 256K L2 Cache
- 3.5" 1.44MB Diskette Drive
- 64-Bit PCI Video Accelerator - 1MB
- MS DOS 6.22, Windows for Workgroups 3.11
- 101-Key Keyboard & MS Mouse
- Energy-Star Compliant
- Desktop or Mini-Tower Chassis
- Three-Year Parts & Labor Warranty

Business Workstation

\$1,699

- 540MB Enhanced IDE Hard Drive
- 14" .28 NI monitor
- Business Lease: \$65 / month

Best Buy!

Ultimate Multimedia

\$2,199

- 850MB Enhanced IDE Hard Drive
- 15" .28 NI SVGA monitor
- Microsoft Office Standard 4.2 Bundle
- 4X IDE CD-ROM, 16-bit Audio Card, and Stereo Speakers
- Business Lease: \$84 / month

With 90MHz Pentium Processor - add \$100

Custom Add-Ons

AUSTIN TELEMETRY-32

Multi-Tasking Fax/Modem/Answering Machine/Audio Board

- 19.2 Kbps V.32bis/V.17 Data Speed
- 14.4 Kbps Group 3 Fax Speed
- Auto Sensing for Incoming Voice/Fax/Modem
- Voice Mail with Remote Access/Retrieval
- Automatic Forwarding of Voice/Fax Messages
- 16-Bit Wave-Table Stereo Playback & Recording (Up to 44.1KHz)
- Caller ID / Call Screening (where available)
- Duplex Speaker Phone

Installed Communications Manager

\$199

AVAILABLE WITH ALL CONFIGURATIONS

INTERNET SURFBOARDS

Bundled with On-Line Services: Prodigy, America Online, CompuServe, Imagination Network, Official Airline Guide, Wealth Builder, Reuters Money Network, NetCruiser

14.4Kbps Internal Fax/Modemadd **\$49**

28.8Kbps Internal Fax/Modemadd **\$159**

Ask About Custom Configurations!

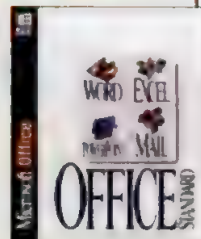
We'll Build a System that Fits Your Individual Requirements!

Microsoft Office Pre-Installed

Let Austin Build You A New Office!

It's a SOFTWARE OFFICE BUT IT WORKS HARD.

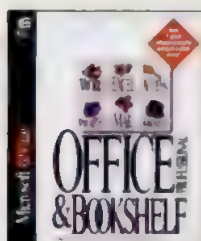
And manages the details so you can keep your mind on more important matters. Like the weekend. Seriously. AutoTools, Intellisense Wizards and Cue Cards get projects done - even large ones - faster.



Buy an Austin System and Get a New Office.

The applications that make up Microsoft Office all work alike, with consistent toolbars, menus and dialog boxes. Microsoft Office Standard 4.2 comes complete with all the industry

standards: Word 6.0, Excel 5.0, PowerPoint 4.0 and Mail 2.0. Microsoft Office Professional 4.3 adds in the power of Access, Bookshelf '94 and Office Assistant. Move up to a new level of power and convenience with Microsoft Office pre-installed on your new Austin system.



Microsoft

Call Now
800-483-9938

Ad Code: 9901



AUSTIN

A Division of IPC Technologies, Inc.

2121 Energy Drive, Austin, Texas 78758
512-339-3500 • FAX 512-454-1357

Government Sales: 800-833-4472
Fortune 1000 Sales: 800-622-5506
Canadian Sales: 800-338-1565
International Sales: 512-339-3547



pentium
PROCESSOR

Visit Our New WorldWide Web Home Page
<http://www.ipctechinc.com>



©1995 IPC Technologies, Inc. All rights reserved. The Intel Inside logo is a registered trademark of Intel Corp. Intel Pentium, DRAM, D1X, D1X2, D1X3 are trademarks of Intel Corp. Microsoft is a registered trademark and Windows and the Windows logo are trademarks of Microsoft Corp. All other company names and product names are trademarks or registered trademarks of their respective owners. Screens simulated for advertising purposes. The above are special promotional prices. Prices and specifications are subject to change without notice. Actual configuration shipped may vary from products shown. We are not responsible for errors in typography or photography. *Business Lease term reflects 36-month contract.

Mark 95 score was low, a result of using Microsoft Windows 3.11 instead of Microsoft Windows for Workgroups.

In terms of battery life, only the Toshiba Satellite Pro T2150CDT's 2:58 performance bested that of the V41 among multimedia notebooks. The V41 ran for 2:36 on our WinDrain test thanks to its standard dual-battery configuration. This setup consists of a removable main battery that occupies the notebook's "multimedia pocket" and an internal subbattery. Though the subbattery alone powers

the system for less than an hour, it makes the main battery hot-swappable.

The multimedia pocket can also hold a removable floppy disk drive (included with the system) instead of the main battery. By

the time you read this, Panasonic will offer the \$649 CF-VEV 411, a module that will enable the V41 to run full-motion MPEG video.

Although the V41's travel weight tips the scale at 9.6 pounds, Panasonic packs a lot of features into the package. Aside from the system's double-speed CD-ROM drive, you get a 648MB hard disk, two stacked Type II PC Card slots, 16-bit stereo sound with wavetable synthesis, two speakers, and a clip-on microphone. The V41 also includes a three-year warranty.—JLW

Panasonic Personal Computer Co., Secaucus, NJ; 800-742-8086, 201-271-3182; fax, 201-392-6618.

Circle 480 on reader service card

Sager Midern Computer Inc.

Sager NP7659T

Sager NP9549A

Both the \$3,895 Sager NP9549A multimedia notebook and the \$3,995 full-featured Sager NP7659T are bargain-priced for their respective categories. And they'll meet your expectations for both features and performance.

Their one major flaw is short battery life.

The Sager NP9549A is based on a DX4/100 CPU and features a 10.5-inch active-matrix screen, a 16-bit stereo sound system capable of FM synthesis, and two speakers. The unit was an above-average performer on all tests in comparison with the ten other multimedia notebooks we reviewed. That's because Sager made some good choices, such as including 256K of L2 cache and installing Microsoft Windows for Workgroups. This unit is similar to Aspen Computer's Universa-CD, Broadax Systems' BSI NP9549A, and Wedge Technology's ShowBIZ (all reviewed in this roundup).

The Sager NP9549A has a travel weight of 9 pounds, about average for multimedia notebooks in this roundup. The Sager NP9549A's score on our WinDrain battery test was 1:19—not an impressive showing.

Like the Sager NP9549A, the Pentium/90-based Sager NP7659T was an above-average performer in its full-featured category. The system came loaded: 24MB of RAM, 256K of L2 cache, a 772MB hard disk, a 9.5-inch active-matrix screen, 16-bit audio, and Windows for Workgroups—and it's priced at only \$3,995. Broadax Systems' BSI NP7659T and BSI NP7657D (reviewed elsewhere in this issue) are also similar to this unit.

The Sager NP7659T also faltered on our WinDrain test, lasting just 1:24. The machine has an 8.8-pound travel weight, and additional batteries weigh 1.2 pounds apiece.

Sager provides a one-year parts-and-labor warranty with these systems.—MEB

Sager Midern Computer Inc., City of Industry, CA; 800-669-1624, 818-964-8682; fax, 818-964-2381.

Circle 481 on reader service card

SUITABILITY TO TASK

Sager NP7659T

Desktop replacement	Good
Road warrior	Fair

SUITABILITY TO TASK

Sager NP9549A

Desktop replacement	Good
Road warrior	Fair

Samsung Electronics America Inc.

SENS700

NoteMaster S3945T

Samsung's notebooks—both based on DX4/75 CPUs—are a study in contrasts. The SENS700 (\$4,019 direct), positioned as a high-end unit, includes appealing features such as a 10.4-inch active-matrix screen and 16-bit audio but waters them down with a paltry 313MB hard disk and unimpressive performance. The entry-level NoteMaster S3945T (\$2,828 direct), which offers a 9.4-inch active-matrix screen and a 516MB hard disk, was a strong performer among value notebooks, but its battery life was lacking.

Samsung also sells the SENSLite 200 subnotebook (not reviewed) and recently announced the SENS800 notebook, available in 75- and 90-MHz Pentium versions.

Each notebook has a travel weight of 7 pounds and includes one Type II and one Type III PC Card slot, a hot-swappable battery, and a removable hard disk. The models are both upgradable to a 732MB hard disk. Beyond these basics, the SENS700 adds 16-bit stereo sound with

two speakers, a built-in microphone, and speaker-out and microphone jacks.

The SENS700 and the NoteMaster produced very similar performance results. The NoteMaster (with 8MB of RAM) posted average Winstone 95 and Disk WinMark 95 scores and an above-average Graphics WinMark 95 score. The SENS700 was less fortunate, since its full-featured competitors performed better on the whole than the value notebooks. It received below-average marks on all our Windows-based tests in its class despite having 20MB of RAM.

Two factors worked against both Samsung notebooks. Neither used Windows for Workgroups, which permits 32-bit disk access. And both systems used Western Digital's Rocketchip graphics accelerator, which

SUITABILITY TO TASK

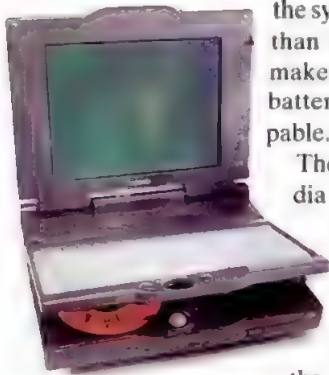
SENS700

Desktop replacement	Good
Road warrior	Good

SUITABILITY TO TASK

NoteMaster S3945T

Desktop replacement	Fair
Road warrior	Fair



Panasonic V41



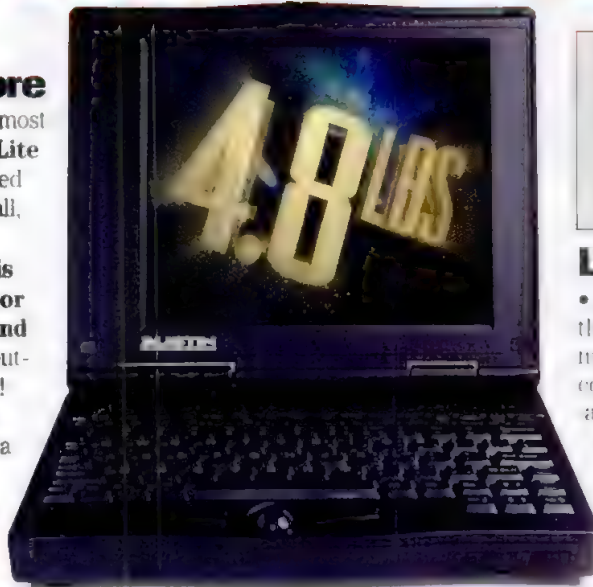
Sager NP7659T

Mobile One.

Also available with
Microsoft
Office Standard 4.2
or Office Professional 4.2

Lift Less, and Accomplish More

Even though it's lighter than most notebooks, the **Austin StepLite** delivers DX4 power, a full-sized keyboard, convenient trackball, and PCMCIA expansion. In short, the **Austin StepLite** is a heavy-hitting road warrior hidden in a tough, 4.8-pound package. And the StepLite outperforms puny subnotebooks! For example, the 9.5" screen is 21% larger than the Toshiba Portégé display, and the StepLite's case is 50% thicker than the competition's.



Austin's StepLite notebooks weigh less than five pounds and have more power and a larger screen than more expensive Compaq and Toshiba notebook computers

Wall Street Journal, 6/1/95

Leader of the Pack.

- **Austin Vista Notebook** offers the largest available screen on the market today. Its 11.3-inch DSTN color display gives you more viewing area than any other in the industry.
- With an **average two-minute response time on technical support calls**, our customer service is a cut or two above the competition.

Business Audio	Business Audio	Austin Vista™	Austin StepLite™
TRY PENTIUM TECHNOLOGY	ROAD-TESTED PERFORMANCE	GET THE BIG PICTURE	TRAVEL LITE ON YOUR FEET
Business Audio Pentium-75 \$2,753 • 75MHz Intel® Pentium® Processor • 10.4" DSTN Display • 8MB RAM (expandable to 40MB) • 256K 64-Bit L2 Cache • 340MB IDE Drive (Local Bus IDE) • 2 Type II or 1 Type III PCMCIA Slots • Integrated Trackball Mouse • 16-Bit Business Audio Features: Built-in Microphone and Speaker, External Jacks for Line-In/Line-Out • Windows Sound System, Cylogic Voice User and External Mic for True Speech Recognition • Microsoft® Office Standard 4.2 • Weight with Battery: 6.8 lbs. • One-year parts & labor warranty • Business Lease: \$104/mo.	Business Audio 486DX4-100 \$2,890 • 100MHz Intel 486DX4 Processor • 10.4" DSTN Display • 8MB RAM (exp. to 20MB) • 540MB Hard Drive • 14.4K Internal Fax/Modem • 2 Type II or 1 Type III PCMCIA slots • Integrated Pointing Stick Mouse • IRDA (Infrared Remote) port • 16-Bit Business Audio Features: Built-in Microphone and Speaker, External Jacks for Line-In/Line-Out • Windows Sound System, Cylogic Voice User and External Mic for True Speech Recognition • Microsoft Office Standard 4.2 • Weight w/ Battery: 5.5 lbs. • One-year parts & labor warranty • Business Lease: \$103	Austin Vista 486DX4-100 \$3,115 • 100MHz Intel 486 DX4-100 • 11.3" DSTN Display, Local Bus Video • 8MB RAM (expandable to 28MB) • 703MB Hard Drive • Local Bus IDE • 2 Type II or 1 Type III PCMCIA Slots • Integrated Pointing Stick Mouse • 16-Bit Business Audio Features: Built-in Microphone and Speaker, External Jacks for Line-In/Line-Out • Windows Sound System, Cylogic Voice User and External Mic for True Speech Recognition • Microsoft Office Standard 4.2 • Weight w/ Battery: 6.5 lbs. • One-year parts & labor warranty • Business Lease: \$118	Austin StepLite 486DX4-75 \$2,697 • 75MHz Intel 486DX4 Processor • 9.5" STN Display • 8MB RAM (expandable to 20MB) • 810MB Hard Drive • External 3.5" 1.44MB FDD • Local Bus IDE • 2 Type II or 1 Type III PCMCIA Slots • Integrated Pointing Device • EPP/ECP Parallel, 16550 High Speed Serial, Keyboard, SVGA Ports • Advanced Power Management • Microsoft Office Standard 4.2 • Weight with Battery: 4.8 lbs. • One-year parts & labor warranty • Business Lease: \$102

Ask about Austin Systems Pre-Installed with Microsoft Office Standard 4.2 or Microsoft Office Professional 4.3.

Call Now
800-483-9938

Ad Code: 8830



AUSTIN™

A Division of IPC Technologies, Inc.

2121 Energy Drive, Austin, Texas 78758
512-339-3500 • FAX 512-454-1357

Government Sales: 800-833-4472
Fortune 1000 Sales: 800-622-5506
Canadian Sales: 800-338-1565
International Sales: 512-339-3547



Visit Our New WorldWide Web Home Page
<http://www.ipctechinc.com>



©1995 IPC Technologies, Inc. All rights reserved. The Intel Inside logo is a registered trademark of Intel Corp. Intel Pentium, DX4, DX2, DX are trademarks of Intel Corp. Microsoft is a registered trademark and Windows and the Windows logo are trademarks of Microsoft Corp. All other company names and products are trademarks or registered trademarks of their respective owners. Screens simulated for advertising purposes. The above are special promotional prices. Prices and specifications are subject to change without notice. Actual configuration shipped may vary from products shown. We are not responsible for errors in typography or photography. *Business Lease term reflects 36-month contract.

CIRCLE 012 ON READER SERVICE CARD

couldn't keep up with units equipped with Chips & Technologies' 65545 graphics chip set, the graphics speed demon of this roundup.

On our WinDrain test, the SENS700 posted an average timing of 2:06. The NoteMaster did not perform as well, with a timing of only 1:24. Both units used nickel hydride batteries.

The units are each backed by a two-year warranty.—JLW

Samsung Electronics America Inc., Ridgely Park, NJ; 800-933-4110, 201-229-4000; fax, 201-229-4029.

Circle 492 on reader service card

Sceptre Technologies Inc.

SoundX Series 3000

Pentium 90

SoundX Series 3000

Pentium 75

The \$5,754 SoundX Series 3000 Pentium 90 and the \$4,154 SoundX Series 3000 Pentium 75 from Sceptre Technologies stand out for their exceptional performance. Both came loaded with plenty of memory and 256K secondary cache to support their Pentium processors. Not surprisingly, the units' performances were at or near the top of their respective categories.

The full-featured SoundX Pentium 90 is geared toward corporate power users. The value-class SoundX Pentium 75 provides Pentium-level power in a more cost-effective solution. Compal, Sceptre's parent company, manufactures these units as well as similar offerings from ARM Computer, FutureTech Systems, Midwest Micro, and Wedge Technology (all reviewed elsewhere in this roundup).

Sceptre also sells the 486-based Series 1000 notebooks,



Samsung SENS700.

which are low-cost, entry-level machines. The company will soon release a more modular version of these units in the Series 2000 systems, which feature removable and interchangeable components including a CD-ROM drive, battery, and built-in AC adapter.

Besides the difference in CPU speed, the principal distinction between the Sceptres reviewed here is screen type: The SoundX Pentium 90 has a 10.5-inch active-matrix display, while the SoundX Pentium 75 came with a 10.4-inch dual-scan panel. The SoundX Pentium 90 also has more RAM than its sibling, 24MB versus 16MB.

Both Sceptres use the same case, featuring a generous wrist rest and trackball centered below the keyboard. Both included 14.4-Kbps PC Card fax modems, and both have a serial infrared port in the back. These systems also feature integrated 16-bit audio, two speakers, and a built-in microphone.

The units each have a proprietary port in the back to accommodate a \$560 docking station. This dock provides two ISA slots, one 3.5-inch and one 5.25-inch drive bay, and microphone and speaker jacks.

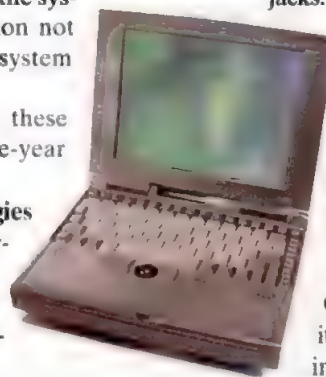
Performance sets the Sceptres apart from the pack. Both had above-average scores on nearly all Windows-based tests (except for the SoundX Pentium 90's average Disk WinMark 95 score), and the SoundX Pentium 75 had the top Winstone score in its class. On our WinDrain tests, the SoundX Pentium 90 managed 1:56, and the SoundX Pentium 75 lasted 1:45.

Both machines included the Sceptre SSFX utility, which creates mouse and screen effects to enliven presentations. This utility also runs the remote mouse that was sent with the systems (a \$129 option not included in the system price).

Sceptre backs these units with a three-year warranty.—AY

Sceptre Technologies Inc., City of Industry, CA; 800-788-2878, 818-369-3698; fax, 818-369-3488.

Circle 482 on reader service card



Sceptre SoundX Series 3000 Pentium 90.

Sharp Electronics Corp.

Sharp PC-8900

Sharp PC-3050

The full-featured PC-8900, with a street price of \$3,699, is the newest addition to Sharp's PC-8000 line; it is intended for mobile professionals shopping for a desktop replacement. With a street price of \$2,199, the value-class PC-3050 is part of Sharp's new retail notebook line for students and small-office users looking for a general-purpose portable. While both offer some compelling features—including a crisp 10.4-inch active-matrix display on the PC-8900 and a built-in voice modem on the PC-3050—they also fall short in terms of performance.

The PC-8900, with a travel weight of 7.7 pounds,

is made by Twinhead Corp. (whose version is also reviewed in this issue). The unit is powered by a DX4/75 CPU and came equipped with 16MB of RAM

(upgradable to 36MB) and a 481MB hard disk. The hard disk is easily removable, although larger disks are not available. The floppy disk drive is also removable and can be replaced with a second nickel hydride battery (\$189). The PC-8900 offers a solid complement of multimedia features, including built-in 16-bit sound, two speakers, and a built-in microphone, as well as an external speaker and headphone jacks. A 9,600-bps infrared port is standard,

for use with Sharp hand-helds such as the Sharp Wizard or Zaurus (also used in Apple's Newtons). The unit came with a 14.4-Kbps PC Card data/fax modem (included in the street price).

With a travel weight of 6.9 pounds, the PC-3050 is one of the few units in this roundup to use a Cyrix CPU, the Cx486DX2-66. Like its big brother, the PC-8900 has a 10.4-inch Sharp display—in this case, a dual-scan model. The system's 324MB hard disk is easily removable and can be



Sharp PC-8900.

SUITABILITY TO TASK

SoundX 3000 Pentium 90

Desktop replacement	Excellent
Road warrior	Good

SUITABILITY TO TASK

SoundX 3000 Pentium 75

Desktop replacement	Good
Road warrior	Good



Here's Something You Don't See Everyday

In today's graphics-intensive computing environment, a high-resolution monitor quickly becomes a practical business necessity. Fortunately, the new DeluxScan™ 15 Pro and 17 Pro monitors can make the upgrade easy and cost-effective, with everything you need for crisp, clear, flicker-free images at resolutions up to 1600 x 1280 pixels.

DeluxScan Pro even boasts the kind of advanced features you'd expect only on more expensive monitors. Like programmable front panel controls and advanced

Color-Matching technology for a clearer, more color-accurate picture. Full Plug-and-Play compatibility for Windows 95.™ And a Total-Green design approach that meets all Energy Star, DPMS and MPR-II standards.

So maybe it's time you take a look at DeluxScan. *All the features. Hyundai value.* Something you

definitely don't see everyday.

For more information, call
Customer Support

(800) 568-0060

DeluxFacts (800) 501-4986

Internet WWW:<http://www.hea.com>

	FST SIZE	DOT PITCH	MAXIMUM RESOLUTION	GREEN*
DeluxScan 15	15"	0.28	1024 x 768	✓
DeluxScan 15 Pro	15"	0.28	1280 x 1024	✓
DeluxScan 17	17"	0.28	1280 x 1024	✓
DeluxScan 17 Pro	17"	0.26	1600 x 1280	✓
DeluxScan 21	21"	0.28	1600 x 1280	✓

* EPA Energy Star MPR II and DPMS

HYUNDAI
DISPLAY PRODUCTS



DeluxScan is a trademark of Hyundai Electronics America

CIRCLE 170 ON READER SERVICE CARD



SUITABILITY TO TASK

Sharp PC-8900

Desktop replacement	Good
Road warrior	Good

SUITABILITY TO TASK

Sharp PC-3050

Desktop replacement	Fair
Road warrior	Good

upgraded to 500MB. Also like the PC-8900, the PC-3050 has built-in 16-bit audio and two speakers.

The PC-3050 has two features lacking in the PC-8900: an IrDA-compliant IR transceiver and a built-in 14.4-Kbps

voice modem. To this Sharp adds some great software, including Puma Technology's TranXit IR file-transfer package and Pacific Image Communications' SuperVoice, a voice-messaging and fax application.

Both Sharp units were poor performers within their groups. Their below-average scores on all Windows-based tests can be attributed mainly to their use of Microsoft Windows 3.11. On our WinDrain battery test, both units had similar results: 1:47 for the PC-8900 and 1:50 for the PC-3050.

Sharp also included its \$350 Mini-Dock with the PC-8900; the PC-3050 has no docking station connector. The Mini-Dock provides standard connections and adds ports for a SCSI device as well as two stacked Type II PC Card slots.

The Sharp systems come with different warranties: The PC-8900 is covered for three years parts-and-labor, and the PC-3050 is covered for one year.—CV

Sharp Electronics Corp., Mahwah, NJ; 800-237-4277, 201-529-8200; fax, 201-529-9113.

Circle 483 on reader service card

Texas Instruments

**TI TravelMate 5000 75MHz
Pentium TFT
TI TravelMate 4000M/50
Dual Scan Color**



Texas Instruments' TravelMate series—one of which won an Editors' Choice in our issue of April 25, 1995—is back with an exciting new system. Joining the now-familiar \$2,349, 7-pound TI TravelMate 4000M/50 Dual Scan Color is the \$6,449, 7.2-pound TI TravelMate 5000 75MHz Pentium TFT, which combines state-of-the-art technology with innovative, user-

friendly features. The 5000 is also one of our Editors' Choice recipients in this roundup.

The TravelMates target two audiences: The 4000M/50 is for value-conscious buyers, and the 5000 is for mobile power users needing desktop replacements. The 5000 provides the performance and expansion options to hit its target, but the older 4000M/50 lags behind the competition in terms of both performance and features.

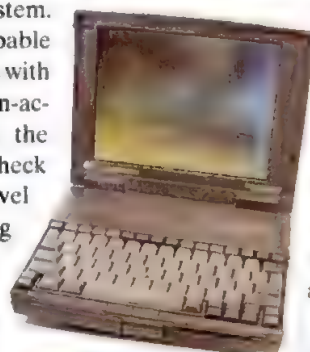
The 5000 uses a Pentium/75 CPU and 256K of L2 cache. It features full PCI support, both internally and externally. This means that peripherals (such as its docking station) attached to the 5000's external PCI connector can take advantage of PCI's high bandwidth.

Also new to the 5000 is a smart lithium ion battery subsystem. The two hot-swappable batteries that come with the unit have button-activated LEDs on the front so you can check their charge level without removing them. At just over 4 hours, the 5000 posted the longest WinDrain time of all tested systems.

To access the ports on the 5000, you simply push a button and the "garage-door" covers disappear inside the notebook. And PC Cards are mercifully easy to remove; just flip the ejector switches above the keyboard and the cards pop right out.

The value-line 4000M/50 notebook retains some of the features that have distinguished it in the past, although its performance has been eclipsed by newer value-oriented machines from other vendors. The 4000M/50 still has an impressive audio subsystem, with built-in 16-bit stereo sound that supports both wavetable and FM synthesis. It also includes on-board MIDI and joystick ports. Unlike many portables, the system can support 1,280-by-1,024 noninterlaced external video at a rock-solid refresh rate of 74 Hz.

The 4000M/50 looks a little more dated with its 9.5-inch dual-scan display, 486DX2/50 CPU, and 325MB hard disk.



**TI TravelMate 5000 75MHz
Pentium TFT.**

And the unit couldn't keep up on our benchmark tests: Its Winstone 95 and Graphics WinMark 95 scores were well below average. Its Disk WinMark 95 score was strong, however, bolstered by Microsoft Windows for Workgroups. The unit also outran most of the competition on our WinDrain battery test, with a time of just under 3 hours.

We also received TI's \$899 Multimedia Docking Station with the 4000M/50. This dock includes a double-speed CD-ROM drive, two speakers, a SCSI port, and front-mounted headphone, microphone, and speaker jacks. The dock has its own battery, which is interchangeable with the notebook's battery.

The TravelMates are backed by different warranties: one year on parts and labor for the 4000M/50, and three years on parts and labor for the 5000.—CV

Texas Instruments, Temple, TX; 800-848-3927, 512-434-1523; fax, 512-250-7329.

Circle 484 on reader service card

Toshiba America Information Systems

**T4900CT
Satellite T2100CS
Satellite Pro T2150CDT**

Toshiba's portables deliver exactly what they promise. The Satellite T2100CS value notebook, aimed at budget-conscious buyers, is aggressively priced at \$2,588. The \$5,098 Satellite Pro T2150CDT multimedia unit is for the cost-conscious who demand a CD-ROM drive. The \$7,298 T4900CT is Toshiba's full-featured system for users who want cutting-edge technology. (Toshiba's new Pentium/90 Portégé 610CT subnotebook is covered in the First Looks section of this issue.)

SUITABILITY TO TASK

TI TravelMate 5000

Desktop replacement	Excellent
Road warrior	Excellent

SUITABILITY TO TASK

TI TravelMate 4000M/50

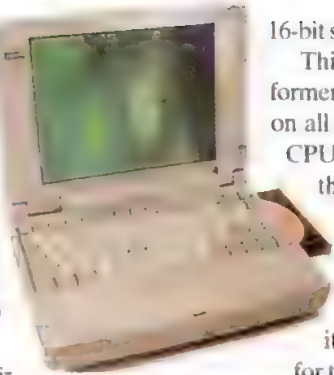
Desktop replacement	Fair
Road warrior	Good

SERVICE & RELIABILITY

Texas Instruments

Reliability	Average
Repair	Average
Technical support	Average
% needing repair	Average

The T2100CS offers a 335MB E-IDE hard disk, two Type II PC Card slots, and an AccuPoint pointing stick. To this Toshiba adds an integrated AC adapter and a 10.5-inch dual-scan display.



On our Windows-based tests, the Toshiba Satellite Pro T2150 CDT, 486DX2/50 CPU—a DX4/75 model will be available soon) faced tough competition. It had Microsoft Windows 3.11 instead of Microsoft Windows for Workgroups, which contributed to its below-average performance. On our WinDrain test, the system ran for 2:21 on its nickel hydride battery.

The T2150CDT uses the same case as the T2100CS, but inside is a double-speed CD-ROM drive, 16-bit sound, EDO DRAM, and a 10.5-inch active-matrix display. This DX4/75 unit posted an above-average Disk WinMark 95 score and average Winstone 95 and Graphics WinMark

16-bit sound.

This system was a competitive performer in its class, posting average scores on all of our Windows-based tests. Its CPUmark₁₆ score was the lowest of the Pentium/75-based units here, however—it was the only Pentium/75 without L2 cache.

Toshiba backs the T2100CS with a one-year warranty, while its other two systems are covered for three years.—CV

Toshiba America Information Systems, Irvine, CA; 800-334-3445, 714-583-3000.

Circle 485 on reader service card

Twinhead Corp.

Slimnote 5100T Slimnote 5100C

Twinhead Corp.'s Slimnote 5100s have earned a reputation for providing strong performance and well-rounded features at a competitive price. The \$5,129 Slimnote 5100T (previously reviewed in our roundup of January 24, 1995) and the \$2,929 Slimnote 5100C both offer 16-bit wavetable sound, stereo speakers, and easy-to-use, responsive touchpads. This time these systems couldn't keep up with the competition in their respective classes.

The 5100T and 5100C both weigh 9.9 pounds and are powered by DX4/100 CPUs. The full-featured 5100T includes a 9.5-inch active-matrix display, 32MB of RAM, and a 772MB hard disk. The value-oriented 5100C comes with a 10.4-inch dual-scan screen, 16MB of RAM, and a 486MB hard disk.

Both have removable hard disks that are available in capacities up to 1GB. The units' floppy disk drives are also removable and can be replaced by a second nickel hydride battery (\$109).

The units' touchpads, made by Synaptics, are noticeably better than most. The touchpads are pressure-sensitive and, ac-

cording to Synaptics, use neural-network techniques to learn by example. We did find them to be particularly intuitive.

On our benchmark tests, the 5100C posted an above-average Winstone 95 score, an average Graphics WinMark 95 score, and a below-average Disk WinMark 95 score. The 5100T faced stiff competition in its class from Pentium-based units, and as a result posted below-average scores on all Windows-based

tests. On our WinDrain battery test, both Slimnotes ran for just over 2 hours.

Twinhead offers a \$199 port replicator with the Slimnotes. The 2.3-pound unit provides two stacked Type II PC Card slots, a SCSI port, and a MIDI/game port.

The Slimnote 5100s are covered by a one-year warranty. By the time you read this, Twinhead will also be selling Slimnote 8-series notebooks with Pentium CPUs, Super VGA displays, NTSC-compliant video ports, and built-in CD-ROM drives.—CV

Twinhead Corp., Milpitas, CA; 800-995-8946; 408-945-0808; fax, 408-945-1080.

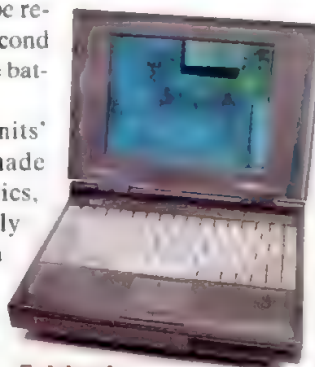
Circle 486 on reader service card

Unisys Corp.

Travel Partner Travel Asset

The Travel Partner full-featured notebook and the Travel Asset subnotebook, both part of the PW² Advantage Series, mark Unisys Corp.'s entry into the mainstream portables market. Sold mostly direct, these units are targeted at the typical Unisys customers: large government and Fortune 1000 accounts. Although both offer some compelling features—including a built-in fax modem on the Travel Partner and a 9.5-inch active-matrix display on the Travel Asset—they didn't stack up well against their competition. The Travel Partner was a poor Windows performer, and the Travel Asset is simply too heavy for a subnotebook. Both are also expensive: The Travel Partner lists for \$5,331 and the Travel Asset lists for \$4,247.

The DX4/100-based Travel Partner



**Twinhead
Slimnote 5100T.**

SUITABILITY TO TASK

T4900CT

Desktop replacement	Good
Road warrior	Good

SUITABILITY TO TASK

Satellite T2100CS

Desktop replacement	Fair
Road warrior	Good

SUITABILITY TO TASK

Satellite Pro T2150CDT

Desktop replacement	Good
Road warrior	Good

SERVICE & RELIABILITY

Toshiba

Reliability	Better than average
Repair	Better than average
Technical support	Better than average
% needing repair	Better than average

An ordinary PC?

With a PC you run into walls. You can only work:

By yourself (sorry, no collaborating).

By e-mail (but not from your pager).

By leaving notes (you can't record a voice message on a regular PC).

Or a Globalyst™ PC&C?

With an AT&T Globalyst there are no walls.

You can work with the data you need.

The people you need. The flexibility

you need. (That's what PC&C—

Personal Computing and Communications—is all about.)



AT&T Globalyst features at no extra cost:

- ☐ MessageFlash™/MailFlash™: send key messages, e-mails to alphanumeric pagers.
- ☐ AT&T Vistium™ Share Software: allows real-time collaboration with others on live Windows™ files—even if you're miles apart.

☐ AT&T NoteIt!™: special screen saver lets colleagues leave a voice or typed message on your Globalyst.

☐ Call 1 800 447-1124, ext. 1113 for more info, or e-mail us on the Internet: pcc.info@daytonoh.attgis.com



Intel Pentium or 486 • Processor speeds from 50MHz-133MHz
4 PCMCIA Slots • 4MB-192MB Memory • 540MB-2GB Hard Disk

*Bringing computing and communications together
to help you get, move and use information.*



AT&T

Global Information
Solutions

SUITABILITY TO TASK

Travel Partner

Desktop replacement	Fair
Road warrior	Fair

SUITABILITY TO TASK

Travel Asset

Desktop replacement	Fair
Road warrior	Fair

included 20MB of RAM. Faced with Pentium-powered competition in the full-featured category, its performance fell short: All the unit's Windows-based test scores were below average.

Some of the Travel Partner's features are also a step behind those of the competition. With a travel weight of 8.3 pounds, it is a full pound heavier than many full-featured units we reviewed. Its active-matrix screen measures only 9.5 inches. It came with a removable 500MB hard disk; larger disks are not available. The unit does have a connector for a dock or port replicator, but the connector is oddly placed on the notebook's front.

The Travel Partner's built-in 14.4-Kbps fax modem is a welcome feature not found on many units here. The system also has built-in 16-bit stereo sound. Powered by a large nickel hydride battery (stretching the width of the notebook's case), the Travel Partner lasted a competitive 2:35 on our WinDrain battery life test.

The Travel Asset faces some stiff competition in the subnotebook market because of its hefty size and short battery life. On the upside, the system is powered by a DX4/75 CPU, comes with 20MB of RAM, and has 16-bit wavetable sound. It was also a strong performer on our Windows-based benchmark tests; its only below-average score was on our Disk WinMark 95 tests.

On the other hand, the Travel Asset is big for a subnotebook—nearly as large as the typical full-featured notebook—and weighs 6.6 pounds before you add the external floppy disk drive. On our WinDrain battery test, the nickel hydride-powered Travel Asset lasted only 1:14. And it was equipped with only a 325MB hard disk, the maximum size

available at the time of the review (although Unisys says larger disks will be available by the time you read this).

Unisys covers both units with a three-year parts-and-labor warranty. There are various contracts for additional service programs available.—CV

Unisys Corp., San Jose, CA; 800-448-1424, 716-924-0480; fax, 716-742-6671.

Circle 487 on reader service card

Wedge Technology Inc.

ShowBook P5 ShowBook EL ShowBIZ

Wedge Technology's systems should prove appealing to two of its intended audiences but will likely falter with the third. The \$5,770 full-featured ShowBook P5 came with 40MB of RAM (a \$932 premium over a similarly configured system with 16MB), and it balances great performance with a good feature set. If price is your primary consideration, take a look at the \$1,829 value ShowBook EL, a serviceable system with the lowest price in this roundup. With the \$6,533 multimedia ShowBIZ, Wedge missed: This unit can boast neither best price nor best performance, and it has features that are found more cheaply and better implemented elsewhere.

The Pentium/90-based ShowBook P5, with a 7.9-pound travel weight, was the best performer among the Wedge systems. This PCI-based system particularly excelled on our Winstone

95 and Graphics WinMark 95 tests. It had a below-average WinDrain time, however, of 1:37. The system also features 16-bit stereo sound, a 689MB hard disk, and a 10.5-inch active-matrix screen.

The ShowBook P5 is similar to units from ARM Computer, FutureTech Systems, Midwest Micro, and Sceptre Technologies (all reviewed in this roundup).

With the ShowBook EL, you make a clear trade-off in performance for price. The Cx486DX2-66-based Show-

Book EL, with only 8MB of RAM, faced a field with DX4- and even Pentium-based units, some equipped with 16MB of RAM. Therefore, it's not surprising that the ShowBook EL had below-average scores on our Windows-based tests. The unit had a reasonable 7.1-pound travel weight but an unimpressive WinDrain score of 1:33.

With one Type II PC Card slot, no sound, and a 9.5-inch dual-scan screen, there isn't a whole lot of punch to this system. Novacor's Nova OpenNote is a similar unit (reviewed elsewhere in this roundup).

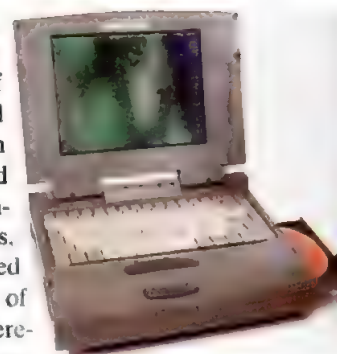
The ShowBIZ includes 16-bit stereo sound, a double-speed CD-ROM drive (swappable for a floppy disk drive, which can also be used externally), a 9.5-inch active-matrix display, and 24MB of RAM. Its screen is removable and can be placed on an overhead projector; it even comes with a stand to prop your notebook up to projector level and a fan to cool the screen. Aspen Computer's Universa-CD (reviewed elsewhere in this roundup) is a similar unit.

The ShowBIZ's price doesn't reflect its performance trade-offs. The system, with a 9.2-pound travel weight, had below-average scores on all Windows-based tests. Its WinDrain score was near the average for its class, at 1:49.

One factor that hindered the performance of all the Wedge systems was their use of Microsoft Windows 3.1 instead of Microsoft Windows for Workgroups. Wedge backs these systems with a one-year-parts, three-years-labor warranty.—Melissa J. Perenson

Wedge Technology Inc., Milpitas, CA; 800-872-9334, 408-263-9888; fax, 408-263-9886.

Circle 488 on reader service card



Wedge ShowBIZ



Unisys Travel Asset

SUITABILITY TO TASK

ShowBook P5

Desktop replacement	Excellent
Road warrior	Good

SUITABILITY TO TASK

ShowBook EL

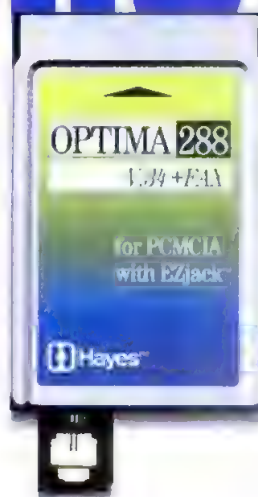
Desktop replacement	Poor
Road warrior	Poor

SUITABILITY TO TASK

ShowBIZ

Desktop replacement	Good
Road warrior	Poor

NO COMPARISON



- 4:1 compression for speeds up to only 115,200 bit/s.
- Uses 90% more battery power in sleep mode (50mA) milliamps.
- V.34 compatibility only.
- Preference unknown.
- 8:1 data compression for DTE speeds up to an incredible 230,400 bit/s.
- 90% *less* battery power is used in the PowerSmart mode (5mA) milliamps.
- V.34 and V.FC compatibility for connecting to the widest variety of 28.8K modems.
- Preferred 3 to 1 by Fortune 1000 companies in Gallup Survey.

Introducing the OPTIMA 288 PCMCIA modem with EZjack,™ the 28.8 modem with a rugged, pop-out telephone connector. Leave it to Hayes to give you a modem with more of what you want. Faster speeds. Longer battery power. Greater compatibility. Plus special features including flash memory for fast, easy feature upgrades. Telephone calling card "tone"



detection. And distinctive ring recognition. And like all OPTIMA modems, it's genuine Hayes. Extremely fast. PowerSmart. Hassle-free. What more could you need. For detailed information on the PCMCIA modems that are incomparable, call 800-377-4377, Ext. 100 or use *Hayes FAX Response* at 800-HAYES-FX and select Document 950.

Hayes
Increasing the Speed
of Business.™



Hayes Online: 404-446-6336. ©1995 Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. Hayes, the Hayes icon, and the Hayes logo are registered trademarks, and the Hayes 302 Escape Sequence Patent icon, Increasing the Speed of Business, OPTIMA and EZjack are trademarks of Hayes Microcomputer Products, Inc. "The OS/2 READY! mark is a registered trademark of IBM Corporation and is used by LICENSEE under license."



WinBook Computer Corp.

XP DX4-100 32/810 TFT XP DX4-100 16/520 Dual-Scan Color

If you're looking for a competitively priced, feature-rich notebook, take a look at the offerings from WinBook Computer Corp. We received both full-featured and value configurations of the WinBook XP DX4-100: the \$5,119 32/810 TFT and the \$3,199 16/520 Dual-Scan Color, respectively. The value WinBook was a very strong performer in its class, while the full-featured WinBook held its own against some stiff Pentium-based competition.

These two DX4/100-based machines share many of the same features. Each has a built-in 14.4-Kbps fax modem and 16-bit stereo sound with a single speaker embedded in the sizable wrist rest. The new active-matrix WinBook XPs—which will be available by the time you read this—will each include a pair of additional speakers in the upper corners of a 10.4-inch display.

You also get your choice of pointing device: A Lexmark pointing stick is standard, and you can purchase either an Alps touchpad (\$79.95) or a Logitech 19-mm trackball (\$29.95). All of these devices are accurate and usable, and you can use the pointing stick and one of the other devices simultaneously.

These systems' design reflects thought and intelligence, with a compact AC adapter, easy access to the battery and to the optional audio daughtercard (included here), and CPU and memory sockets. Both machines weigh 7 pounds equipped for the road.

SUITABILITY TO TASK	
XP DX4-100 32/810 TFT	
Desktop replacement	Good
Road warrior	Good
SUITABILITY TO TASK	
XP DX4-100 16/520	
Desktop replacement	Good
Road warrior	Good

The value-configured Dual-Scan Color comes with 16MB of RAM, a 463MB hard disk, and a bright 10.3-inch dual-scan Sanyo screen. This system was one of the best-performing value notebooks in our roundup, with

well-above-average scores on all Windows-based benchmark tests. The unit's nickel hydride battery also performed well, yielding an impressive WinDrain score of 2:15.

The TFT unit was equipped with 32MB of RAM, a 771MB hard disk, and a 9.5-inch active-matrix display from Hitachi. This system produced a mixed bag of test scores in its full-featured category. Its Disk WinMark 95 score was above average and its Winstone 95 score was average, but its Graphics WinMark 95 score was below average. On our WinDrain test, this system ran for only 1:49.

WinBook offers a \$399 docking station that includes a quad-speed CD-ROM drive, an additional 5.25-inch drive bay, and two ISA expansion slots.

These units are covered by a one-year warranty, and an optional three-year warranty will be available by the time you read this.—MJP

WinBook Computer Corp., Columbus, OH; 800-468-2162; fax, 800-448-0308.

Circle 489 on reader service card

Zenith Data Systems

ZDS Z-Noteflex ZDS Z-Star EX

The components and features of ZDS's notebooks are appealing: The Z-Star EX is a light and inexpensive value system (\$2,124 list, \$1,950 street), while the full-featured Z-Noteflex (\$5,084 list, \$4,670 street) includes a notable extra—a removable screen for mobile presentations. Both have performance drawbacks, however.

ZDS aims the DX4/100-based Z-Noteflex at the traveling professional with extensive computing needs. The unit's 8-pound travel weight and removable 9.5-inch active-matrix screen enhance its appeal for mobile presenters. The screen is complemented by the optional Flexsite Video Display stand (\$169), to which it attaches. The system comes with a 14.4-Kbps PC Card fax modem from Megahertz and features built-in 16-bit sound. To increase battery

life, you can swap the floppy disk drive for a second battery (included in our tested configuration, but otherwise a \$110 option). The hard disk is also easily removable for upgrades or security.

The 486DX2/50-based Z-Star EX, which has a travel weight of 6.4 pounds, is a value system aimed at the cost-conscious user. As with the Z-Noteflex, the floppy disk drive can be substituted for an optional second battery (\$67) for longer road life, and the hard disk is removable. Though key size is the regulation 19 mm, the Spacebar is a fraction of normal size. The unit also includes PC Card slots and an audio/modem access slot, which accepts a proprietary modem or 16-bit sound module.

The Z-Star EX's AC adapter is wafer-thin and light, so you won't mind bringing it along—fortunate, considering that the nickel hydride battery lasted only 1:20 on our WinDrain test.

The AC adapter on the Z-Noteflex, while not as slim as the one for the Z-Star EX, is still a light alternative to others we saw in this roundup. The unit lasted just under 2 hours on our WinDrain battery life test.

The Z-Star EX's performance on our benchmark tests, however, was poor. Its Windows-based test scores were all below average.

The Z-Noteflex turned in less-than-stellar results as well. Winstone 95 and Graphics WinMark 95 scores were below average for the full-featured category. The unit's

SUITABILITY TO TASK

ZDS Z-Noteflex

Desktop replacement	Good
Road warrior	Fair

SUITABILITY TO TASK

ZDS Z-Star EX

Desktop replacement	Fair
Road warrior	Fair

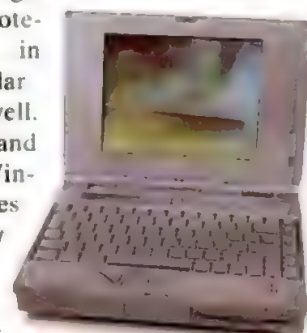
SERVICE & RELIABILITY

Zenith Data Systems

Reliability	Worse than average
Repair	Worse than average
Technical support	Worse than average
% needing repair	Average



**WinBook XP DX4-100
32/810 TFT.**



ZDS Z-Noteflex.

DiskMark 95 score was the exception: It was average.

Neither notebook came with L2 cache—a feature we saw on more than a third of the notebooks in this roundup—which in part accounts for the subpar performance. Another factor is simply the processors these units use: The 486DX2/50-based Z-Star EX could not match units with DX4 CPUs, which dominated the value class, and the Z-Noteflex's DX4/100 CPU could not compete with Pentium-based units.

The Z-Noteflex is protected by a three-year parts-and-labor warranty, with one year of on-site, next-business-day service included. The Z-Star EX is supported by a one-year parts-and-labor warranty with on-site service included for the year. CO/Session software is standard on all systems to enable remote diagnostics in modem-equipped units.—*MEB*

Zenith Data Systems, Buffalo Grove, IL;
800-533-0331, 708-808-5000; fax, 800-472-7211.

Circle 490 on reader service card

ZEOS

Meridian 850A Meridian 850C

ZEOS offers near-desktop performance and features at a competitive price with its two sub-8-pound notebooks, the \$4,995 Meridian 850A and \$3,795 Meridian 850C. Both machines—which use Intel's notebook-oriented Pentium processor in the slim tape-carrier package—were top-ten performers in their class on almost every test, except our WinDrain battery test, where both units were poor performers.

ZEOS offers two other notebook lines: the Meridian 400 subnotebooks and Meridian 800 notebooks, which are value-line units with a choice of 486DX2/50 or DX4/100 CPUs.

There are few differences between the two ZEOS units. Both are based on Pentium/75 CPUs, but the 850C has a 504MB hard disk and the 850A has a 773MB hard

disk. The important difference is the screen: The 850C has a 10.3-inch dual-scan screen with 800-by-600 resolution, and the 850A has a 9.5-inch 640-by-480 active-matrix screen. Both systems offer integrated 16-bit stereo sound with FM and wavetable synthesis.

The 850C, submitted in our value category, was the better performer of the two. Its Winstone 95 score was among the top five of its peers and was also higher than that of the full-featured 850A, which was still above average in that category. The 850C was the top value performer on all other Windows-based benchmark tests. Its CPUmark₁₆ score was also among the top five. Its WinDrain score of 1:08 was below average, however.

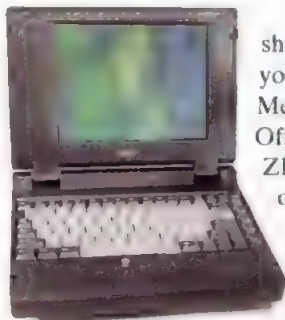
The 850A also performed impressively, with above-average scores on all of our tests except our WinDrain battery life test, on which it posted a below-average score of 1:14.

ZEOS and two divisions of Micron Technology—Micron Computer and Micron Custom Manufacturing Services—recently merged. The two Micron divisions and ZEOS are now united under an umbrella company named Micron Electronics; however, ZEOS will continue to manufacture ZEOS-brand machines, and Micron will continue to manufacture Micron-brand machines.

Pentium/90-based Meridians should be available by the time you read this. Both reviewed Meridians come with Microsoft Office Professional preinstalled. ZEOS notebooks come with a one-year parts-and-labor warranty.—*MEB* □

ZEOS, Minneapolis, MN;
800-554-7172, 612-362-1234;
fax, 612-362-1205.

Circle 491 on reader service card



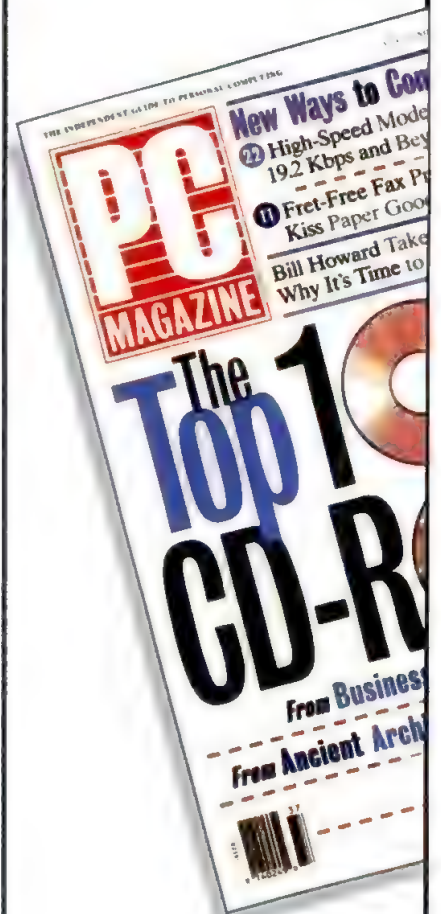
ZEOS Meridian 850A.

SUITABILITY TO TASK	
Meridian 850A	
Desktop replacement	Good
Road warrior	Fair

SUITABILITY TO TASK	
Meridian 850C	
Desktop replacement	Good
Road warrior	Fair

SERVICE & RELIABILITY	
ZEOS	
Reliability	Average
Repair	Average
Technical support	Average
% needing repair	Average

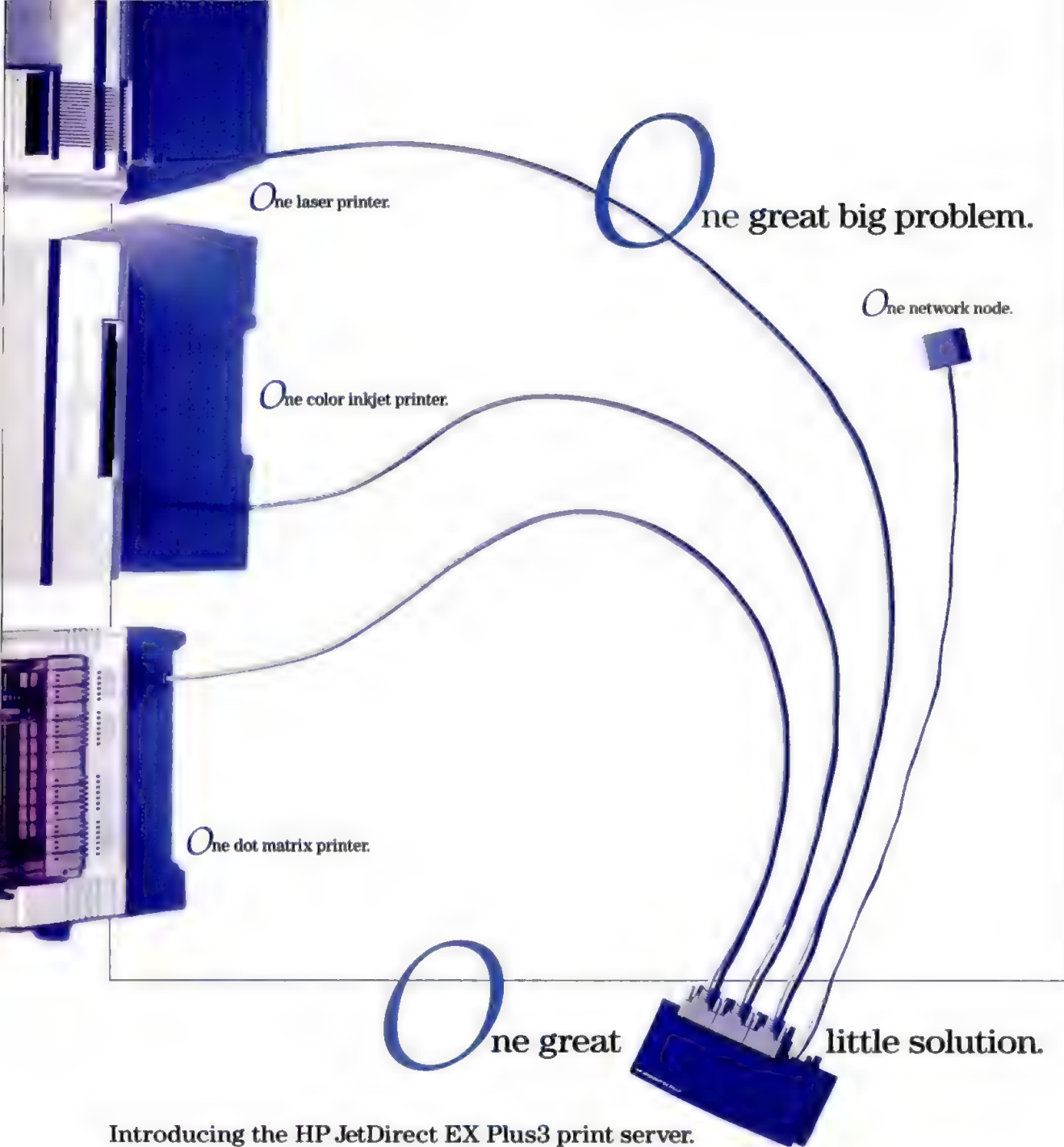
Hey!
**Is this
your copy of
PC Magazine?**



**If not,
call:**

1-800-289-0429

**to subscribe
and get a
FREE gift.**



Introducing the HP JetDirect EX Plus3 print server.

Now you can connect up to three parallel printers to a single network node.

Your office has all kinds of printers, and all kinds of printer configurations, all of which can change daily. And it's your job to hook them all

up to the network. With a limited number of nodes, that can be a big problem.

Fortunately, there's an easy way out—and in. The new HP JetDirect EX Plus3 print server lets you connect up to three printers to the

network, using only one LAN connection. Best of all, it works with any parallel printer, and supports virtually every network protocol and NOS out there.

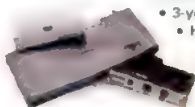
For fast faxed information, call 1-800-964-1066.* You'll discover that for every problem, there's a solution. At least when it comes to network printing.

NOS Compatibility: Novell NetWare; Microsoft® Windows™ 95, Windows NT, Windows for Workgroups, LAN Manager; IBM LAN Server; UNIX®: HP-UX, SunOS, Solaris, IBM AIX, SCO UNIX, Ipd; Apple EtherTalk

Management Support: HP JetAdmin print management software enables consistent installation and management of any HP JetDirect connected printer on the network;

supports SNMP-based network management software

- Flash memory for easy upgrades
- Multiple protocols with automatic switching
 - Three high-performance IEEE 1284 ports
 - 3-year return to HP warranty
- HP JetDirect EX and EX Plus3 print servers support all parallel printers
- HP JetDirect cards support HP printers with I/O slots



**HEWLETT®
PACKARD**



PORTABLE PRINTERS

FEWER TRADE-OFFS

The new generation of portable printers doesn't make you choose between easy portability and great output. You get both. Your only decision: small or smaller.

By Bruce Brown

Portable printers have been quietly evolving. Units we looked at in the past were frequently more remarkable for their shortcomings than for their advantages. Struggling to fit 15 pounds worth of printer into a 5-pound package often just didn't work. Some early mobile units were downsized dot matrix printers—slow, noisy, and at almost 10 pounds traveling weight, portable in name only. Next came ink jet portables, such as the successful (now discontinued) Kodak Diconix. These had better output than dot matrix printers but showed tell-tale ink jet overspray (fuzzy remnants at characters' edges), especially on plain paper. The evolution of the species has been steady but, like *Homo sapiens* losing its little toes, slow

Transportable:**Canon BJC-70**Ultraportable:**Pentax PocketJet**

There are two types of portable printers: Those that try to deliver desktop printer-like features in a manageable package and those that aim to deliver great printing in as small a package as possible.

All of the portables we saw for this roundup delivered good (and even excellent) print quality, and none of them will disappoint you—unless you choose the wrong type of machine for your purposes. If you want a machine that can travel with you occasionally without being much of a burden, but that still offers most of the paper-handling features, cartridge life, and speed of a traditional desktop printer, you want a transportable unit. Of the five transportable machines we tested, our Editors' Choice designation goes to the new Canon BJC-70. For about \$360 on the street, you get excellent monochrome and four-color ink jet printing, class-leading speed, and versatile paper-



handling features including a 15-page built-in sheet-feeder and envelope printing—all in a compact 4-pound package.

You can choose from three modes (economy, normal, and fine) to stretch the already generous life of the black-ink cartridge (rated at 2,000 text pages), or pop in a four-color ink cartridge for mixed monochrome/color capability. Cost per page is very low (Canon estimates 4 cents for monochrome text, 32 cents for 30 percent color coverage), making the Canon attractive as a desktop printer where space is at a premium.

With its 60-page sheet-feeder option (\$99), the HP DeskJet 320 (\$359 street) is another good candidate if you want a printer for your desk but don't have the

room. The successor to the DeskJet 310, which garnered Editors' Choice a year ago, the 320 still features good ink jet output and respectable throughput. But the Canon offers true four-color printing compared with the HP's optional three-color fare (\$49), and the HP is heavier (over 8 pounds) and exceedingly bulky if you plan to travel with the sheet-feeder.

If you plan on having the printer with you as a permanent fixture in your briefcase or computer bag, portability is probably your first concern (with high-quality output a close second). In this ultraportable category, we bestow Editors' Choice status on the 2-pound Pentax PocketJet—acknowledging some shortcomings necessitated by the ultracompact design. For instance, you'll have to give up the ability to produce envelopes and transparencies on the road (the PocketJet requires special paper), you can't do color, and you'll have to hand-feed sheets one at a time. But you won't have to give up output quality or speed. The PocketJet was at or near the top on our performance tests, and its silent direct-thermal printing technology produced monochrome text that rivals the best laser-printer output. The slender, lightweight PocketJet is an excellent traveling companion.

enough to cause hardly a stir.

That is, until this past year. The newest ink jets have raised the bar on print quality. You can now get desktop printer-quality text and graphics printing—even color graphics—in a book-size package weighing under 5 pounds. And if that's still too heavy for you, check out two new thermal-based printers. They deliver sharp text output (and one even does color) at about 2 pounds traveling weight.

According to BIS Strategic Decisions, a market research firm in Norwood, Massachusetts, these improvements and the changing demographics of the PC-user profile have finally spurred growth in the portable printer market. When the laptop market exploded several years ago, most industry watchers expected the portable printer market to follow suit. It didn't. There were too many convenience trade-offs users had to make in order to get porta-

bility. But the balance is tilting. More than 530,000 portable printers were sold in 1994, a 30 percent increase from 1993, and BIS projects an annual growth rate of 20 percent. The current products offer speed, resolution, and ease of use approaching or even matching those of their desktop counterparts, and they're designed to be not much of a burden.

► IN THIS REVIEW

Products reviewed:	
Canon BJC-70.....	225
Citizen PN60.....	228
DECwriter 90ip.....	230
HP DeskJet 320.....	232
Mannesmann Tally MobileJet.....	230
Olivetti JP50.....	230
Pentax PocketJet.....	240
Performance Tests.....	228
Summary of Features.....	234
Monochrome Output Guides.....	238
Color Output: Canon Fares Best.....	240

A TALE OF TWO TIERS

When it comes to portable printers, there are two clear class distinctions, with different target markets. Ultraportable printers emphasize portability over features. The latest offerings weigh around 2 pounds and are small enough that you can simply shove one of them in your computer bag and forget it's there until duty calls. The penalties come in convenience. Such units don't offer sheet-feeders (you have to feed paper in a sheet at a time), don't print on envelopes or other special stock, and can have ultratiny ribbons or cartridges that require frequent replacement, driving up the cost for each printed page.

For a true road warrior—who spends most if not all of the time traveling, and whose office is a plane, train, or automobile—the ultraportable is often the way to go. This user's low-volume print jobs consist of documents such as contracts, receipts, and insurance estimates that need to

Portable Printers

**Suitability to Task:
Portable Printers**

In the past, portable printers exacted penalties in print quality, speed, paper handling, or all three. The newest crop of mobile printers has improved the genre to the point that you now have several good choices, whether you want a dual-purpose portable for occasional trips or an ultraportable to carry every day. We look at some of the most salient attributes.

For **portability** we measure and weigh the units. The lighter the better. We also take into consideration the physical design of the printer: What are its dimensions when it is folded for traveling, and how much space will you need to set it up? The smaller the better. For this rating we also consider the ruggedness of the unit, as well as the number of pages you can expect to print before its battery runs out.

Product Name	
SUITABILITY TO TASK	
Portability	Poor
Text printing	Fair
Graphics printing	Good
Paper handling	Excellent

Long-life consumables are also a plus, so you won't have to carry many extras.

Text printing is another important consideration. What good is having a printer with you if you're embarrassed to present its output? Better units produce crisp characters, with little or no fuzziness, as well as clear differentiation between normal and boldface fonts. In addition, the ink should not run, smear, or fade.

To examine **graphics printing** we print sample business charts and halftone images. We look for a printer that exhibits a good gray-scale range and

little or no banding. Color capability is a plus, and we check for vibrant, well-saturated colors with no signs of bleeding.

Paper handling is important if you need to print long documents or produce envelopes and transparencies on the road. Ideally, a unit should have a sheet-feeder with good capacity and be able to print on a variety of stock types and sizes.

be produced on-site, so fancy (and bulky) sheet-feeder options and color graphics printing are not as appealing as compactness. BIS reports this segment accounts for about 35 percent of the portable sales.

If you're not willing to sacrifice all the creature comforts of your desktop printer, consider the second type of unit: a transportable printer. You'll have to carry a little more weight (about 5 pounds) and plan for the printer when you pack your bags, but you'll get a bona fide sheet-feeder (from 15 to 60 sheets), the ability to print on different types of media, and longer-life consumables. The majority of portable-printers are sold to this type of business user—someone who needs the printer for travel only occasionally (to produce updates to presentation slides, sales forecasts, thank-you letters, and the like).

A third type of user is emerging, as PCs continue their steady penetration into homes. With the price and feature deltas between desktop and portable printers shrinking, many are willing to pay the pre-

mium for the space-saving aspects of a portable. The small footprint and minimal overall bulk make these units ideal for tight workspaces or restricted home quarters, especially apartments or dormitories where rooms have to serve many purposes.

REVIEW CRITERIA

It's along these lines—ultraportable printers for use on the go and transportable units that can also serve as desktop-printer replacements—that the products we evaluated for this story are divided. For this roundup we requested new models specifically targeted for portable use. The printers also had to be able to run on battery power, even if the batteries themselves are optional (as they are in most cases).

Our search turned up seven new printers: the Canon BJC-70, a four-color ink jet; the Citizen PN60, a four-color thermal-transfer unit; the DECwriter 90ip, Manesmann Tally MobileJet, and Olivetti JP50, essentially similar monochrome ink jet models manufactured by Olivetti; the

HP DeskJet 320, a three-color ink jet that replaces last year's Editors' Choice HP DeskJet 310; and the monochrome-only Pentax PocketJet, a direct-thermal printer.

Canon was readying a monochrome-only version of the BJC-70, dubbed the BJC-30, but it was not ready in time for this article. Also on the market are the ATI SlimWriter, a thermal-fusion printer from Atlantic Technologies (910-350-0700); and Citizen's thermal-fusion Notebook Printer II. These units were reviewed in last year's portable printer story ("No Desk Necessary," *PC Magazine*, August 1994), so we did not revisit them this year.

Two of the units adhere to the "less is more" ultraportable approach: the Citizen and the PocketJet. Whereas the smallest unit we saw a year ago weighed 3.4 pounds and was about the size of a carton of cigarettes, these two units weigh about 2 pounds apiece and are each a little larger than an old-fashioned slide rule.

You'll have to make a little more effort to take along the transportable printers in this story. The Canon, HP, and Olivetti trio fall into the transportable camp, cramming more desktop-printer features into somewhat larger, heavier machines. At right around 5 pounds, though, they are still very manageable.

WHAT WE FOUND

Just a few years ago, output quality and printing speed were the Achilles' heels of portable printers. The specter always loomed: Would you want to spend the time waiting for the output—and would you be embarrassed to use it once it was done? We were pleased to find that all of the tested printers delivered on their design promises. Most had shortcomings in one or more areas, but any one of these printers will do the job if you need to crank out a quick proposal or reprint a client letter if a name is misspelled. Speed and print quality varied, but not as much as anticipated and not entirely along expected lines.

Print quality ranged from good to terrific for all of the printers, though in every case you get the best results when you use special paper. The five ink jets and the Citizen can all print on plain paper, while the PocketJet is restricted to roll or cut-sheet thermal stock. The ink jets performed best in their highest-

Our Contributors: BRUCE BROWN is a contributing editor of *PC Magazine*. JAMIE M. BSALES was the editor in charge of this story, and MICHAEL J. ZULICH was the project leader.

WHEN WE SAY OUR
SPORTSTER® IS THE
BEST V.34 MODEM
ON THE MARKET,
THAT'S ADVERTISING!



BUT WHEN TWO INDEPENDENT TESTING LABS PROVE IT, THAT'S RESEARCH.



The Sportster's big win over the biggest names in modems didn't take us by surprise. For some time we've known through our own tests and comparisons, customer feedback, press awards, ratings and above all, sales, that our *True V.34™* modems were in a class by themselves.

Now two leading independent labs, TeleQuality Associates and Henderson

Communications Laboratories, report the same conclusion: in three critical measurements -- Compatibility, Connect Rate and Throughput -- the U.S. Robotics Sportster simply blew away the rest of the field.

In our advertising, we always say we make the best modems. Now we've got the research to prove it. Call U.S. Robotics for a summary report or the full testing methodology and findings.

C A L L 1 - 8 0 0 - D I A L - U S R



Portable Printers

quality modes on transparency stock and on coated paper. But even on plain paper the ink jet printers produced text and graphics on a par with what you would get from desktop printers in the same class: just a bit of fuzziness in text printing, with no smearing or blotching. The Citizen produced incomplete letters and graphics on plain paper but much better print on special high-quality laser stock. While the PocketJet can't do a thing with plain paper, the new Pentax thermal cut-sheet paper feels and looks good. Even better, the printer's output for both text and graphics was clear, sharp, and very black—easily mistaken for laser-printer output.

As color printing becomes more prevalent in offices and homes, many users will find they need portable printers that offer color printing as well. To print in color with the DeskJet, you need to replace the standard black-only ink cartridge with HP's \$49 color cartridge. While its color is good, the DeskJet's three-color process uses only cyan, magenta, and yellow ink to create all colors. If black appears on a color page, the printer mixes all three inks, but this composite black is not as dark as true black. We got better blacks and richer hues overall from the Canon and Citizen printers, which use a four-color process (cyan, magenta, yellow, and black) to print in color. The Citizen is not intended for heavy color applications, but for minor color touches; because of a high rate of ribbon consumption, the Citizen didn't even complete our "100 percent coverage" full-page color test image. When used as intended, however, it can add little bits of color without chewing through ribbons at too rapid a rate.

On our DOS-based Print Speed test, which tries to elicit the best possible text printing speed you can expect from a printer, the transportable Canon bested the pack, with a showing of 114 characters per second. The ultraportable Citizen showed a sluggish 24 cps. Overall the Canon was the fastest printer, with the tiny PocketJet second. The remaining ink jets had similar scores on all tests, comparable with mainstream 2- to 3-page-per-minute printers. The Citizen was by far the slowest, demanding patience as it slowly produced final output.

QUALITY-OF-LIFE ISSUES

All of the printers were easy to use. Setup was simply a matter of attaching cables and loading printer drivers, though loading the Windows driver for the Olivetti triplets took more steps than many users will like. The DeskJet has the least intuitive paper loading and mechanical operation, but once installed it works well and is exceptionally rugged. All of the larger transportable models feature multiple-page sheet-feeders (though it's a rather bulky \$99 option on the DeskJet). This lets you attend to other tasks while the unit is printing. With the ultraportable Citizen and PocketJet, you'll have to stay close by to hand-feed sheets one at a time.

Consumable supplies are a factor with all printers, but especially with portables, which typically use smaller cartridges or ribbons. For example, the Citizen, intended for short runs only, burns through its microcassette-size ribbon cartridges quickly. Expect about 30 text pages per ribbon. The DeskJet, by contrast, uses the

same ink cartridges as the desktop DeskJet 540, so it will run the longest before needing new supplies: about 1,000 text pages with the black cartridge. The PocketJet, meanwhile, uses no consumables other than the special thermal paper.

Another consideration is having the special consumables on hand when you need them. Here, the DeskJet has an advantage: Since it uses the same cartridges as the best-selling DeskJet 540, any major computer supply store should have them in stock. The other manufacturers do take phone orders and offer overnight delivery of supplies if you run short.

Cost per page is also an important consideration, especially if you plan on using the printer as your primary output device. At about a nickel a pop, text pages from the Canon and DeskJet models cost you the same as pages from a desktop ink jet. Printing with the Citizen (15 cents per text page) is somewhat pricey; the Olivetti trio and Pentax units will set you back 8 to 10 cents per page, which is reasonable for a portable printer. If you'll be relying on bat-

HIGHLIGHTS

The allure of a portable printer to complement your laptop is clear. Producing a contract on demand or printing out last-minute changes to a presentation yourself makes life on the road a lot easier than finding a service bureau in a strange town or asking your client to print a file for you.

THERE ARE TWO TIERS in the portable printer market: bigger with everything and smaller with less.

Your choice depends on how often you need your printer with you and how much you'll print while traveling. Transportable units are for those who need an occasional travel partner for producing documents away from the office. Ultraportables are for road warriors who need a printer with them always.

TRANSPORTABLE PRINTERS cram as many features as possible into a manageable design (usually around 5 pounds, including AC adapter).

They offer versatile paper handling, such as automatic sheet-feeders and the ability to print on envelopes and other kinds of stock, as well as good speed, desktop printer-quality output (preferably with color capability), long-life consumables, and reasonable cost per page. Because they offer the essentials, these units can also serve as replacements for traditional personal printers if desk space is at a premium.

ULTRAPORTABLE PRINTERS focus on size at the expense of some conveniences. Weighing in at around 2 pounds, they have a go-anywhere aspect unmatched by transportables. But there are trade-offs. The lack of paper trays means you'll have to feed sheets one at a time—an annoyance for longer print jobs. Also, their diminutive consumables need replacing often. Still, if you have small print jobs but need a printer with you at all times, an ultraportable is your best bet.

Portable Printers

tery power, be sure the rated number of pages per charge is more than sufficient for your largest print jobs. And carry a spare battery so you won't be caught short. Vendors recognize that most users won't run the printer on DC power, though, and don't even include the battery in the purchase price. The only exception here is the PocketJet; the others will charge you from \$49 to \$125 for battery power.

In case you do want to run a printer on batteries, three battery types are used. Nickel cadmium batteries are the most common and least expensive rechargeable batteries, but suffer from their infamous memory effect: They won't recharge completely unless they've totally discharged. Nickel hydride batteries are more expensive than nickel cadmium but last longer and don't have as much memory effect. The Citizen, DeskJet, and PocketJet run on nickel cadmium batteries; the Canon takes nickel hydride; and the DECwriter, MobileJet, and Olivetti run on either, as well as standard AA batteries.

GET DOWN TO IT

When you choose a mobile printer, your satisfaction will depend on how well you match your needs with the size and features of the printer you buy. If you need to carry along a printer only a few times a year, but when you do you want to print many pages, buy one of the bigger models and live with the extra weight and bulk. If you absolutely need a printer with you every day for "just-in-case" emergencies, you are the buyer the ultraportable was designed for. If your usage profile falls between these two extremes, it's probably better to decide in favor of more features, even though the bigger units are heavier.

If you need color printing, your choices are limited. You should also determine what variety of paper stock you'll work with and whether you can live with a printer that can't print envelopes. Since the most common task you'll perform with the printer is to load paper, be sure that the sheet-feeder capacity and operation are a good match for your intended use.

Whether you're looking for a printer that primarily sits on your desktop but can travel occasionally or one small and light enough to be your constant companion, you now have several good choices.

Canon Computer Systems Inc.

Canon BJC-70

ALL REVIEWS BY BRUCE BROWN



If you're looking for monochrome or four-color printing for the road that's as good as you get from your desktop ink jet, the Canon BJC-70 (\$399 list, \$359 street) is what you want. Its unsurpassed combination of quality output, speed, versatile paper handling, and compact size earns it top honors in this roundup.

With its cover closed for traveling, the transportable-class Canon measures 2.1 by 11.6 by 6.2 inches (HWD). A total volume of 175 cubic inches and weight of 4 pounds (including the AC adapter but excluding the optional nickel hydride battery) means it'll take up some space in your computer bag. But the Canon earns its portage.

Setup is a simple matter of pushing one button, snapping in the ink cartridge, and pushing the button again. Then load paper, attach the power and parallel cables, and you're ready to go. You have a choice of three emulations for DOS printing (Canon Extended Mode, Epson LQ-2550, and IBM Proprinter X24E), and the included Windows driver has an accompanying graphical help and reference guide. Conveniently, instructions for replacing ink cartridges are printed on the sheet-feeder, though you barely need them.

Canon lets you choose between a high-capacity black-only cartridge and a four-color (cyan, magenta, yellow, black) cartridge. Both let you replace only the ink tanks or the whole cartridge, as needed. The 128-nozzle black cartridge (\$40) prints in 180-dpi economy mode, 360-dpi normal and fine modes, and 720- by 360-dpi mode with smoothing. Canon rates the cartridge life at an ample 2,000 pages.

The color cartridge has 64 nozzles for black printing and 24 each for cyan, magenta, and yellow; maximum resolution is 360 dpi. The 2,000-page cartridge has a small (30-page) black-ink tank and a 40-page color tank. Canon estimates cost per text page to be a modest 4 cents—the most reasonable of all the printers here. Color printing will cost you around 32 cents for a typical page.

Overall print quality was on a par with



▶ FACT FILE

Canon BJC-70

List price: \$399; black-ink cartridge, \$40, color-ink cartridge, \$45, black-ink tank, \$17, color-ink tank, \$22, black-ink tank for color cartridge, \$12; nickel hydride battery, \$85

In short: The Canon BJC-70 is portable enough not to be cumbersome while offering the best paper handling we saw. With the fastest overall printing speed and very good ink jet print quality for text and graphics in monochrome and in color, the Canon is a great choice.

Canon Computer Systems Inc., 2995 Red Hill Ave., Costa Mesa, CA 92626; 800-848-4123, 714-438-3000.

444 on reader service card

SUITABILITY TO TASK

Portability	Good
Text printing	Good
Graphics printing	Good
Paper handling	Excellent

that of a mainstream desktop ink jet. Text printing in normal mode was very good, with no streaking or running and just a little telltale ink jet fuzziness on plain paper, but none on transparencies. Economy-mode printing was light with occasional misses. Monochrome graphics had good gray-scale differentiation and resolution, with minor banding. Color graphics were very good, with rich, saturated colors and just a little banding on coated stock, less on transparencies, and none on plain paper. The Canon had better overall color output than the other two color-capable printers here, the Citizen PN60 and HP DeskJet 320.

Rated at 4 ppm in text printing, the Canon was the fastest printer on our Print Speed test: 114 characters per second. It was also the fastest at printing the test graphics on our Windows application tests, and the second-fastest (behind Pentax's PocketJet) in producing text from Windows word-processor applications. The Canon was well ahead of the others in color graphics printing, beating the second-place DeskJet by minutes on our three applications tests.

Paper handling is great. The top cover folds back and can feed 30 sheets of

**YOU'LL GET
SERVICE WITH
MOST PCs. THE
QUESTION IS,
HOW MUCH?**

**GUARANTEED AT-YOUR-DESK
NEXT-BUSINESS-DAY**

**NEXT DAY...OR
MAYBE THE
DAY AFTER**

**CALL US
TIMES
FIFTEEN
FIRST**

**YOU CAN'T
OUT YOU
FIGURE IT
RSELF?**

**THE DRS ARE
IN THE MAIL**

GOT A VOL METER?

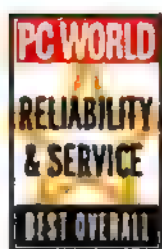


DELL DIMENSION
Reliable PCs For High
Performance Computing



At Dell, we guarantee* if there's a problem with your Dell Dimension PC, a certified technician will be at your desk the next business day, servicing your PC.^Δ

We're the only PC company that guarantees this level of service for a full year. You can extend this service on any Dell Dimension



JUNE 1995

system for an extra two years for only \$199. Looks like our dedication to service is paying off. Dell recently took top honors in the *PC World* Reliability and Service report.

So if Dell is the only PC maker that guarantees next-business-day deside service, there's only one thing left for you to do.

Step right up.

DELL

TO ORDER, CALL

800-765-6270

In Canada,* call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT

Sun 12pm-5pm CT • <http://www.us.dell.com/>

Keycode #04079

DELL DIMENSION™ XPS P133c
133MHz PENTIUM® PROCESSOR

- Mini Tower Model
- 8MB RAM (128MB Max RAM)
- 256KB Pipeline Burst Cache
- 540MB Hard Drive (12ms)
- 15LS Monitor (15" CRT, NI)
- 64-bit PCI 2MB DRAM Video
- 4X Multi-session EIDE CD-ROM Drive
- 3.5" Diskette Drive
- Spacesaver Keyboard/Mouse
- MS-DOS® 6.2/Microsoft® Windows®
- 3.1/30 Days Free Support

★ Upgrade to a 1GB hard drive for only \$125 more

\$2599

Business Lease^⓪: \$96/Mo.
Order Code #500111

DELL DIMENSION P90
90MHz PENTIUM PROCESSOR

- Mini Tower Model
- 8MB RAM (128MB Max RAM)
- 256KB Writeback Cache
- 1GB EIDE Hard Drive (10ms)
- 15LS Monitor (15" CRT, NI)
- 64-bit PCI 1MB DRAM Video
- 4X Multi-session EIDE CD-ROM Drive
- MS Office 4.3, MS Bookshelf, Visio Express for MS Office
- 3.5" Diskette Drive
- Spacesaver Keyboard/Mouse
- MS-DOS 6.2/Microsoft Windows
- 3.1/30 Days Free Support

★ Increase your screen size to 17 inches with our 17LS monitor for \$300 more

\$1999

Business Lease: \$74/Mo.
Order Code #500114

DELL DIMENSION XPS P120c
120MHz PENTIUM PROCESSOR

- Mini Tower Model
- 8MB RAM (128MB Max RAM)
- 256KB Writeback Cache
- 540MB Hard Drive (12ms)
- 15LS Monitor (15" CRT, NI)
- 64-bit PCI 2MB DRAM Video
- 4X Multi-session EIDE CD-ROM Drive
- MS® Office 4.3, MS Bookshelf, Visio Express for MS Office
- 3.5" Diskette Drive
- Spacesaver Keyboard/Mouse
- MS-DOS 6.2/Microsoft Windows
- 3.1/30 Days Free Support

★ Add a US Robotics 28.8 Fax/Modem for only \$149 more

\$2399

Business Lease: \$89/Mo.
Order Code #500113

DELL DIMENSION P75
75MHz PENTIUM PROCESSOR

- Mini Tower Model
- 8MB RAM (128MB Max RAM)
- 256KB Writeback Cache
- 540MB Hard Drive (12ms)
- VS14 Monitor (14" CRT, NI)
- 64-bit PCI 1MB DRAM Video
- 3.5" Diskette Drive
- Spacesaver Keyboard/Mouse
- MS-DOS 6.2/Microsoft Windows
- 3.1/30 Days Free Support

★ Add a 3COM Link III Network Interface Card for only \$109 more

\$1399

Business Lease: \$52/Mo.
Order Code #500115

*Guarantees available in the U.S. only for registered owners of Dell Dimension systems purchased after 8/1/93. For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., 2214 W. Braker Lane, Building 3, Austin, TX 78758. ΔOn-site service provided by BancTec Service Corp. On-site service may not be available in certain remote locations. ⓪Business leasing arranged by Leasing Group, Inc. *Prices and specifications valid in the U.S. only and subject to change without notice. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. MS-DOS, MS, Windows and Microsoft are registered trademarks of Microsoft Corporation. ©1995 Dell Computer Corporation. All rights reserved.

Dell's featured computer artist is Nance Patemoster of San Francisco, CA.



Performance Tests: Portable Printers

Don't let their size fool you: Most of these diminutive printers are remarkably quick and produce excellent output.

What the Numbers Mean

The quickest printer we saw was the Canon BJC-70 ink jet. On our Print Speed test, a DOS-level test designed to elicit the fastest performance you're likely to get from a printer, the Canon produced 114 characters per second (cps). This placed it well ahead of the second-fastest unit, the Pentax PocketJet (73 cps), a thermal printer. The HP DeskJet 320 was a close third at 70 cps. The identical scores (56 cps) of the DECwriter, Mannesmann Tally MobileJet, and Olivetti JP50 are not coincidental: These three ink jet units are all manufactured by Olivetti and utilize the same print mechanism. The Citizen PN60, an ultraportable thermal-based printer, trades portability for speed. The unit produced only 24 cps on the Print Speed test—the slowest in this roundup.

Our Microsoft Windows applications tests indicate how well each manufacturer's Windows printer driver performs with the printer itself. Our suite consists of six of the most popular apps: CorelDRAW 5.0; Harvard Graphics 3.0; Lotus 1-2-3 for Windows, Release 5, Multimedia Edition; Microsoft Word for Windows 6.0; Aldus PageMaker 5.0 for Windows; and WordPerfect 6.1. We do not present data here for the PageMaker and WordPerfect tests. Although we did observe slight differences in the times a printer took to complete these two tests, the results are analogous to the presented scores.

The PocketJet proved the quickest in word processor output, producing our 2-page Word for Windows document in 56 seconds. The Canon was two ticks behind, at 58 seconds, but dominated the field on the rest of the applications tests. On these tests, the Citizen again took several times as long as

its next-slowest competitor.

We also used CorelDRAW, Harvard Graphics, and Lotus 1-2-3 to produce color-output samples from the three units capable of color printing: the Canon, the Citizen, and the DeskJet. The Canon again led the field and was generally about twice as fast as the DeskJet on these tests. The Citizen yielded unacceptably long times—more than 30 minutes for the Lotus 1-2-3 file—and had a short cartridge life of only one to three color pages.

For monochrome-only text printing, the printer with the best-quality output was also one of the speediest: the Pentax PocketJet. Characters were dark, crisp, and well formed, rivaling laser-printer output. The Citizen thermal printer also produced near-laser-quality text. These two printers were less adept at producing gray-scale graphics, however, as subtle shades of gray tended to get lost. The Canon and DeskJet ink jet units proved the best here.

Of the three color units we tested, the Canon exhibited the best all-around color quality. Its four-color print system lays down cyan, magenta, yellow, and black ink to produce rich, well-saturated colors. The DeskJet images showed less banding, but colors from its three-color ink cartridge were not as pleasing as those from the Canon. The slow Citizen printer did produce vibrant colors from its four-color ribbon.

How We Tested

We used an HP Vectra XU 5/90—equipped with a 90-MHz Pentium processor, 16MB of RAM, and a 540MB hard disk—running DOS 6.22 and Microsoft Windows for Workgroups 3.11. For Microsoft Windows applications testing, we installed Windows for Workgroups using a 4MB file-access cache, with virtual memory and Windows' Print Manager turned off. The printers printed in their default resolutions. All word processing applications were printed in black-and-white mode. The remaining Windows applications printed gray-scale images if the given printer was capable. We selected the default color-matching method for color-output samples.—*Analysis written by Denis Tom*

paper, 10 transparencies, or 5 envelopes. You may have to compress the edges of the envelopes before putting them in the feeder, but the firm, even pull and L-shaped paper path work well, depositing the paper directly in front of the printer on the table, desk, tray, or floor, or your lap. A monochrome version of the BJC-70, the BJ-30 (\$299 list, \$259 expected street), wasn't ready in time for testing. Replacing the Canon BJ-10sx, the BJ-30 will share the BJC-70's case, mechanics, and electronics, without the color features. Speed and print quality should be the same.

Canon's service and support for the portables includes a two-year warranty with a quick-exchange option, a 24-hour BBS, and toll-free technical support from 8:00 A.M. to 11:00 P.M. Monday through

Friday and 11:00 A.M. to 6:00 P.M. Saturday (eastern time).

Almost small enough to travel with you at all times, the Canon BJC-70 is the most versatile of the transportable printers, with the best paper handling, fast printing, and good color and monochrome output. If you can buy only one printer, and it has to work at home and on the road, this is the one you want.

Citizen America Corp.

Citizen PN60

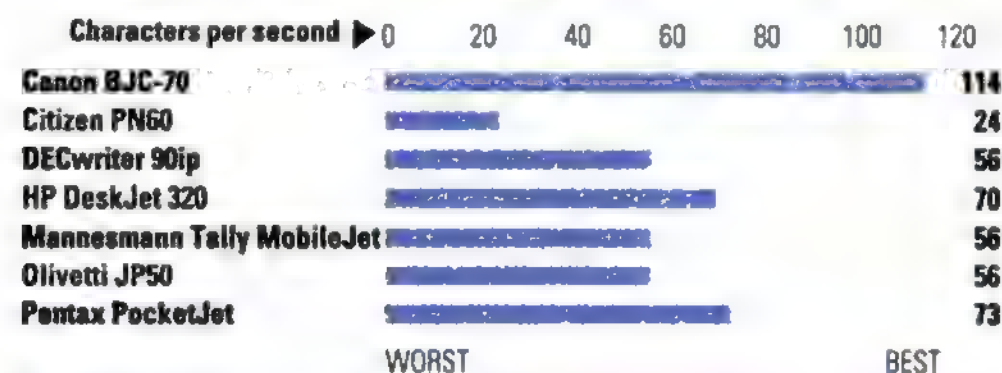
The ultraportable Citizen PN60 doesn't pretend to be an all-purpose printer. The 360-dpi monochrome and four-color thermal-transfer printer (\$399 list, \$325 street) stresses compact size and light weight to let you produce

high-quality documents anywhere. The Citizen is very slow; it requires high-quality paper for best print results (though regular copy paper will work), and it feeds only one sheet at a time. But because it's so small, this is one portable printer that you really might carry everywhere you go, knowing that you'll always be able to knock off a corrected page, a short presentation, or a letter. To make the printer more attractive, Citizen America Corp. is offering the printer bundled with a nickel cadmium battery for \$419.

Traveling weight for the Citizen, including the rechargeable battery and AC adapter, is just over 2 pounds, making it the second-lightest of the printers we reviewed. The printer itself resembles an old slide rule more than a printing device,

PRINT SPEED

The Print Speed test measures the printer's speed in producing one copy of a two-page business letter with 1-inch margins.



MICROSOFT WORD FOR WINDOWS

The Microsoft Word for Windows test measures the printer's speed in producing a two-page text report that uses multiple fonts and type styles.



LOTUS 1-2-3 FOR WINDOWS

The Lotus 1-2-3 for Windows test measures the printer's speed in producing a complex two-page spreadsheet that contains monochrome pie, bar, and line charts.



measuring 1.8 by 10.0 by 3.2 inches (HWD). The total carrying volume is about 47 cubic inches, counting the AC adapter.

The Citizen's thermal-transfer technology uses a small ribbon cartridge placed in a carriage that moves back and forth over the line of print. The black ribbon is all black, but the color ribbons have alternating strips of cyan, magenta, yellow, and black. The tiny ribbons come in packages of two black ribbons (rated for up to 30 text pages each) for \$8.99 and two color ribbons (each rated for 3 to 5 pages of text and graphics) for \$13.99. You'll want to stock up on ribbons since they don't last very long, but their small size and light weight make them easy to carry. Note that such short-life consumables adds up to the highest cost per page we saw: 15 cents for

text and about \$1.75 for color

Setup is as easy as loading the drivers (Citizen's own for Windows, Epson LQ-860 or IBM Proprinter X24E emulations for DOS applications), dropping in the ribbon cassette, and attaching the cable. A single-sheet paper feeder folds down from the front of the unit (so you'll want to leave clearance in front for paper), and it ejects printed pages out the back. A sliding paper guide on the left side lets you adjust for different paper widths; unlike some other portables, the Citizen can even print envelopes.

You can use regular copy paper, but print samples on ordinary paper tended to have some incomplete letters and images. Citizen recommends high-quality paper (such as Weyerhaeuser First Choice) or laser transparency stock. In fact, text out-

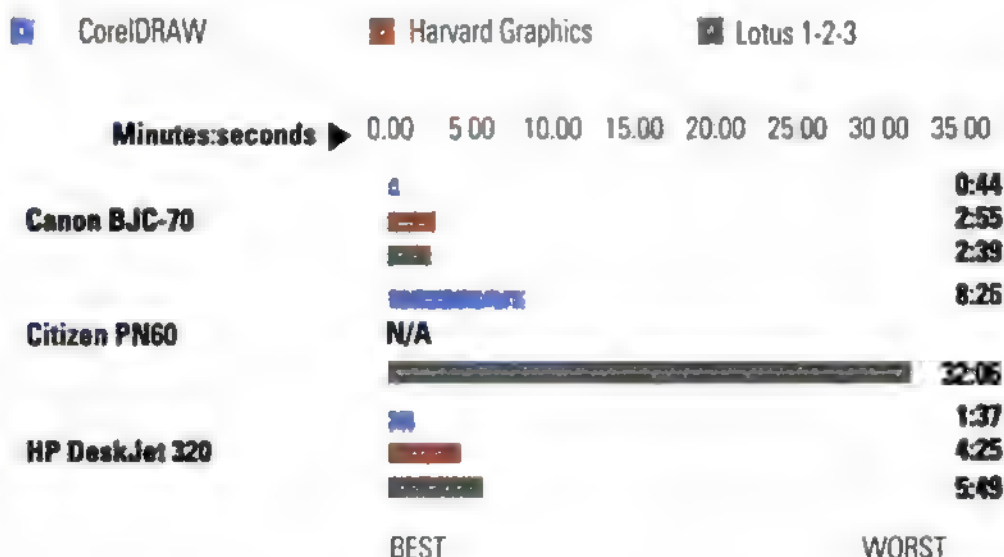
CORELDRAW

The CorelDRAW test measures the printer's speed in producing a single-page CorelDRAW graphic that contains a TIFF image, horizontal and vertical gray scales, a continuous-tone image, and line art



COLOR SPEED

The Color Speed tests measure the printer's speed in producing complex color documents. The CorelDRAW file contains a color TIFF image, color scales, and line art. The Harvard Graphics file contains a business graphic with nearly 100 percent color coverage. With its graduated color background and three-dimensional pie chart, this is the most difficult image for most printers to render. This image appears in this story's color-output sidebar. The Lotus 1-2-3 file contains pie, bar, and line graphs that call for a variety of colors.



N/A -- Not applicable. The printer completed one third of the test page in 9 minutes and then ran out of ink.

put on the better stock was nearly flawless. Letters were very dark and well formed, with crisp, clean edges that surpassed the ink jet output we saw and rivaled even the best laser output. Gray-scale graphics tended to be too dark, however.

The color ribbon produced rich, vibrant colors with just a little banding on our sample documents, and it should prove more than adequate for spot color on charts or to dress up a presentation. But the Citizen is definitely neither intended nor appropriate for color slides with 100 percent coverage or for very dense graphics: The ribbons won't last very long (during our testing, two ribbons produced only half of a single 100-percent-color page), and printing takes an inordinate amount of time with this

Portable Printers

Digital Equipment Corp.

DECwriter 90ip

Mannesmann Tally Corp.

MobileJet

Olivetti Office USA

Olivetti JP50

Three of the printers in this roundup are mechanically and electronically the same and physically almost identical. The DECwriter 90ip, from Digital Equipment Corp. (\$340 list, \$299 street), the MobileJet, from Mannesmann Tally Corp. (\$350 list, \$245 to \$280 street), and the Olivetti JP50, from Olivetti Office USA (\$399 list, \$339 to \$359 street, including a font package), are all manufactured by Olivetti. Differing only in minor details, these transportable monochrome ink jet portables each handle single and multiple sheets well and produce high-quality 300-dpi text and graphics output. These are capable portables, but black-only printing and middling performance don't make them stand out from the competition.

The 250-page black-ink cartridge (about \$25) snaps easily into place when you raise the 15-sheet paper-feed support cover and open the printer's inner cover. Paper feeds in a tight U-shaped path with the output supported in front of but separate from the stock of input paper. This paper path restricts you from printing labels and envelopes, but it does prevent printed pages from dropping directly to the floor and lessens the space you'll need to run the unit.

In terms of portability, these book-size units slot in right between the ultraportable Citizen PN60 and PocketJet and the bulkier HP DeskJet 320. The three units vary slightly in size, because two different types of paper-feed supports are used. The 2.5- by 11.7- by 5.3-inch DECwriter and 2.3- by 11.7- by 5.3-inch MobileJet each have a clear plastic page-support extension that slides inside the cover, while the 2.3- by 11.7- by 5.2-inch Olivetti has articulated arms that unfold for vertical paper support. Other than this minor paper-support variation and some labeling differences, the three printers are identical. Each weighs about 4 pounds including the AC adapter and battery. Each of the models can use a nickel cadmium

battery (rated to last for 80 pages) or ten AA batteries (rated at 40 to 80 pages). The MobileJet and Olivetti also have a nickel hydride battery option rated for 140 pages per charge; though not sold by Digital, this battery will work in the DECwriter as well.

Setting up the printers takes a little patience. The MobileJet and Olivetti manuals scarcely mention Windows and don't specifically mention the Windows driver disk. The DECwriter comes with a better setup guide, which does instruct you to install the Windows driver. In each case the driver disk has a DOS utility that tells you how to install a new printer to Windows' Control Panel printer-setup utility. The driver works fine and installs as it should, but the lack of clear instructions for the Mannesmann Tally and Olivetti printers give Digital's version of this printer the edge for less experienced users. It would be even better if the DECwriter's driver installed automatically via a SETUP.EXE program.

Printer output quality, as expected, was identical, and very good in both text and graphics printing. There was minor fuzziness in text print on plain paper, but on transparencies the fuzziness disappeared. Presentation mode, selected from the fairly Spartan Windows driver options screen, produced very good graphics samples with dark blacks, straight lines, and no banding on plain paper or on coated stock. We did detect some banding in letter-quality mode on both types of paper.

The 50-nozzle ink jet engine used in all three printers is rated at 2 pages per minute in text printing. The printers had identical scores of 56 characters per second on our Print Speed test (using HP PCL 3+ emulation), better than only the slow Citizen PN60. The units landed second-to-last on the Microsoft Word for Windows and Lotus 1-2-3 for Windows tests as well.

Cost per printed page for the three printers hovers around a reasonable 10 cents, and the ink cartridges are rated at 200 to 250 text pages.

The DECwriter, sold through Digital's wide range of retail channels, comes with a two-year warranty. Digital has the best price for supplies, with ink cartridges selling for \$22 and nickel cadmi-

▶ **FACT FILE****Citizen PN60**

List price: \$399, black-ink cartridge twin pack, \$8 99, color-ink cartridge twin pack, \$13 99; nickel cadmium battery, \$79

In short: The ultracompact Citizen PN60 prints in color, and it is a printer that is easy to have with you always. Output on high-quality paper or transparencies is excellent, but this thermal-transfer unit is slow, and you have to feed paper manually, one sheet at a time

Citizen America Corp.,
2450 Broadway, #600,
Santa Monica, CA
90404, 800-477-4683,
310-453-0614; fax,
310-453-2814.

445 on reader service card

SUITABILITY TO TASK	
Portability	Excellent
Text printing	Excellent
Graphics printing	Fair
Paper handling	Poor

type of work (over half an hour per page).

Alas, speed in general isn't a high point. The Citizen churned out only 24 characters per second on our Print Speed test—well behind the next-slowest score of 56 cps and even further behind the other ultraportable thermal printer we looked at, Pentax's PocketJet (73 cps). Results were similar on the other monochrome tests as well, with the Citizen taking at least twice the time of the next-slowest printer. Scores on the Color Speed tests were also painfully slow.

Citizen backs this printer with a two-year warranty, a 24-hour BBS, and toll-free technical support from 11:00 A.M. to 7:00 P.M. (eastern time) Monday through Friday. Its very small size and weight may make you forget you're carrying the Citizen PN60 in your bag—the highest compliment you can pay to a portable printer. This printer's very slow speed, high rate of consumables use, and single-page feeding limit its use to low-volume print jobs. But impressive print quality and convenient size mean you never need to travel without a printer you can count on.

Typhoon
by Dataproducts



FOR THE ULTIMATE IN PERFORMANCE...

POWER UP A 1200 DPI TYPHOON 8!

Dataproducts' Typhoon 8 is the ultimate desktop printer. With stunning, typeset-quality 1200 dpi resolution, full-bleed 11" x 17" imaging, Adobe PostScript Level 2, PCL 5 and now, **free** camera-ready faxing, the Typhoon 8 takes



laser printing to incredible new heights.



Leave your network printing problems behind. The Typhoon 8's patented Virtual Printer Technology (VPT™)

handles multiple protocols and provides custom settings for up to 64 users on your network!

So get up to speed.

At \$5,199, we've broken the price barrier to the next level of printing.

Call today and ask about our free PostScript fax/modem offer
1-800-980-0374



Dataproducts

Taking your printing needs by storm

© 1995 Dataproducts Corporation. Dataproducts and Dataproducts with its associated logomark are registered trademarks and Typhoon and VPT are trademarks of Dataproducts Corp. PostScript is a registered trademark of Adobe Systems Inc. Developer tested only. Novell makes no warranties with respect to this product. CIRCLE 227 ON READER SERVICE CARD

Portable Printers

Monday through Friday. The company also has a 24-hour BBS. Olivetti Office USA sells the JP50 bundled with 25 Bit-Stream scalable fonts. Black-ink cartridges sell for \$29.99, nickel cadmium batteries for \$59.99, and nickel hydride batteries for \$119.99. Olivetti offers a one-year warranty. Toll-free technical support is available 8:30 A.M. to 6:00 P.M. (eastern time) Monday through Friday.

With their 15-sheet paper feeds, these units are easier to use for long jobs than the Citizen and PocketJet. But the Canon BJC-70 and the DeskJet offer color printing and better speed for just a small penalty in size.

Hewlett-Packard Co.

HP DeskJet 320

Although the HP DeskJet 320's predecessor received our Editors' Choice last year ("No Desk Necessary," *PC Magazine*, August 1994), the DeskJet 320 (\$379 list, \$359 street) isn't the standout the HP DeskJet 310 was. The 320 is among the best in this roundup in output quality and speed, but it is still easily surpassed by our new Editors' Choice, the Canon BJC-70. The 320's \$49 color option and \$99 60-page sheet-feeder, however, make this 2-page-per-minute ink jet a suitable choice for use as a space-saving desktop with occasional travel duty.

The 310/320 series has won a number of industrial design awards, and the 320 is certainly sleek-looking. But it is also the least portable printer in this group, weighing 5.1 pounds with its AC adapter. When its sheet-feeder is attached, the 320 weighs a hefty 8.2 pounds and measures 2.8 by 12.8 by 9.5 (HWD) in traveling mode, the bulkiest unit we saw this year.

Based on the same print engine as the HP DeskJet 540, the 320 prints black at 600 by 300 dpi and color at 300 by 300 dpi. The 320 can be fitted with the 540's longer-lasting consumables: a 1,000-page black cartridge (\$32.95) and a 155-page color cartridge (\$34.95). A lower-capacity 500-page black cartridge, for use with the 320 only, sells for \$24.95.

For best results you must switch back and forth between the color and monochrome cartridges if you do mixed print

jobs—a limitation of all three-color printers. You can avoid this inconvenience by getting the four-color Canon BJC-70 or Citizen PN60, each of which is competitively priced. Another annoyance: To replace paper, you have to replace a pressure pad by pressing on it, insert the paper, and then push a button that isn't easily seen from the front of the unit.

While the sheet-feeder has a higher capacity, it is also more cumbersome than any other we've seen for a portable printer. All the other sheet-feeders in this roundup use built-in covers as the paper support, which can be folded up when you open the printer. The 320, however, sits at an angle while unfolding paper-support arms extend up and back. You need 10.5 by 12.8 by 12.0 inches (HWD) to use the 320 with its sheet-feeder.

Except for its inability to print envelopes, the 320 is a versatile paper handler, printing on light and heavy stock, transparencies, and labels. Hewlett-Packard Co. sells several types of special papers for its ink jet printers, but for all



► FACT FILE

DECwriter 90ip

Mannesmann Tally MobileJet

Olivetti JP50

List price: DECwriter 90ip: \$340, black-ink cartridge, \$22; nickel cadmium battery, \$49. MobileJet: \$350, black-ink cartridge, \$25, nickel cadmium battery, \$65, nickel hydride battery, \$125. Olivetti JP150: \$399, black-ink cartridge, \$29.99; nickel cadmium battery, \$59.99, nickel hydride battery, \$119.99.

In short: These three nearly identical units, all manufactured by Olivetti, are portable enough for life on the road but versatile enough to be used as convenience printers for home or office. Lack of envelope printing might be a drawback, but these monochrome ink jets offer acceptable throughput and good print quality.

Digital Equipment Corp., 111 Powdermill Rd., Maynard, MA 01754, 800-777-4343, 508-493-5111; fax, 800-234-2298.

446 on reader service card

Mannesmann Tally Corp., P.O. Box 97018, Kent, WA 98064-9718, 800-843-1347, 206-251-5524, fax, 206-251-5520.

447 on reader service card

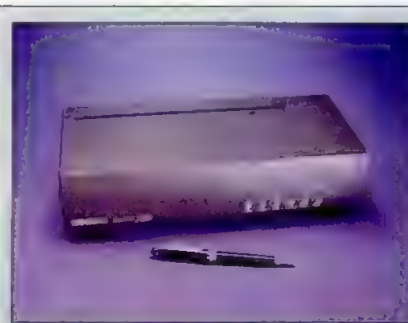
Olivetti Office USA, 765 U.S. Highway 202, Bridgewater, NJ 08807; 908-526-8200; fax, 908-526-8405.

448 on reader service card

SUITABILITY TO TASK

Portability	Good
Text printing	Good
Graphics printing	Good
Paper handling	Good

um batteries for \$49. Digital also has a 24-hour BBS and toll-free technical support available from 8:30 A.M. to 8:00 P.M. (eastern time) Monday through Friday. Mannesmann Tally sells the MobileJet largely through VARs, systems integrators, and major resellers, which typically sell this printer to large sales forces. Mannesmann Tally sells ink cartridges for \$25, nickel cadmium batteries for \$65, and nickel hydride batteries for \$125. A one-year warranty with optional overnight exchange (\$48) for repairs and extended warranties (\$96 per year) is backed by toll-free technical support 10:30 A.M. to 7:30 P.M. (eastern time)



► FACT FILE

HP DeskJet 320

List price: \$379; color kit, \$49; sheet-feeder, \$99, black-ink cartridge, \$24.95; high-capacity black-ink cartridge, \$32.95; color-ink cartridge, \$34.95; nickel cadmium battery, \$49.

In short: Built around the ink jet engine found in the HP DeskJet 540, the HP DeskJet 320 offers good monochrome and color output and admirable performance. It is relatively bulky, though, which makes it better as a desktop-printer replacement for cramped spaces with only occasional travel duty.

Hewlett-Packard Co., Direct Marketing Organization, P.O. Box 58059, MS

5111-L-SJ, Santa Clara, CA 95051-8059, 800-752-0900, 800-387-3867 (Canada); fax, 800-333-1917.

449 on reader service card

SUITABILITY TO TASK

Portability	Fair
Text printing	Good
Graphics printing	Good
Paper handling	Good

Can you increase RAM just by adding Software?



Yes, you can. Introducing MagnaRAM for Windows™, the RAM compression software that expands the power of your available Windows memory by up to 2, 3 or even 4 times. With MagnaRAM's ultra-safe data compression technology, you'll run more Windows programs at the same time, faster than ever before!

Save Time!

- Boost system performance
- Run multiple, larger applications

Save Money!

- Hundreds of \$\$\$ less than RAM chips
- No installation fees, no downtime

Save Hassle!

- End the irritation of slow performance
- Eliminate "out-of-memory" messages

MagnaRAM is quick to install and safe to use. It works with all your existing software, memory managers and hardware. MagnaRAM works for you, right out of the box!

Landmark is committed to providing you with a total solution that's guaranteed to work. That's why we offer toll-free, no-fee, technical support, and a no-risk, 90-day, money-back guarantee.*



~~\$129~~

CALL FOR PRICING!

(800) 683-6696

LANDMARK

RESEARCH INTERNATIONAL CORPORATION

703 Grand Central Street, Clearwater, FL 34616

(813) 443-1331 FAX (813) 443-6603

Landmark software is available from resellers everywhere, including Babbages, Best Buy, CompUSA, Computer City, Egghead, Electronics Boutique, Eltek-Tek, Fry's, Future Shop, Incredible Universe, Lechmere, Micro Center, Office Depot and Software Etc.

Copyright © 1995 Landmark Research International Corporation. All rights reserved. Windows is a trademark of Microsoft Corporation. *Reseller return policies may vary.

CIRCLE 069 ON READER SERVICE CARD

SUMMARY OF FEATURES

Portable Printers

PC MAGAZINE
EDITOR'S CHOICE

PC MAGAZINE
EDITOR'S CHOICE

■ YES ■ NO

Products listed in alphabetical order

	Canon BJC-70	Citizen PN60	DECwriter 90ip	HP DeskJet 320	Mannesmann Tally MobileJet	Olivetti JP50	Pentax PocketJet
List price	\$399	\$399	\$340	\$379	\$350	\$399	\$529
Print technology	Ink jet	Thermal fusion	Ink jet	Ink jet	Ink jet	Ink jet	Direct thermal
Rechargeable battery options	Nickel hydride (\$85)	Nickel cadmium (\$79)	Nickel cadmium (\$49), AA batteries	Nickel cadmium (\$49)	Nickel cadmium (\$65), nickel hydride (\$125), AA batteries	Nickel cadmium (\$60), nickel hydride (\$120), AA batteries	Nickel cadmium (included)
Rated battery life (number of text pages per battery)	200	30-40	80	100	80 (nickel cadmium), 140 (nickel hydride)	80 (nickel cadmium), 140 (nickel hydride)	30-35
Weight (including AC adapter, in pounds)	4.0	2.3	4.6	5.1	4.5	5.0	2.0
Travel dimensions (HWD, in inches)	2.1 x 11.8 x 6.2	1.8 x 10 x 1.9	2.5 x 11.7 x 5.3	2.5 x 12.1 x 5.8	2.3 x 11.7 x 5.3	2.3 x 11.7 x 5.2	1.2 x 10 x 2.2
Volume (cubic inches)	153.0	34.2	155.0	173.9	142.6	139.9	24.7
Dimensions when open (HWD, in inches)	5.1 x 11.8 x 9.1	1.8 x 10 x 3.2	8.2 x 11.7 x 7	10.5 x 12.8 x 12	8.2 x 11.7 x 7	9.5 x 11.7 x 8	1.2 x 10 x 2.2
Dimensions of AC adapter (HWD, in inches)	1.6 x 5 x 2.8	1 x 2.8 x 4.5	2.3 x 4 x 2.8	1.1 x 4.8 x 2.8	2.3 x 4 x 2.8	2.3 x 4 x 2.8	1.2 x 2.7 x 6.1
Volume (cubic inches)	22.4	12.4	24.8	14.6	24.8	24.8	19.8
Printing Features							
Color capability	■	■	■	■	■	■	■
Print elements	128 nozzles (monochrome), 136 nozzles (color)	60 cells	50 nozzles	50 nozzles (monochrome), 51 (color)	50 nozzles	50 nozzles	N/A ¹
Maximum resolution (dpi)	720 x 360	360 x 360	300 x 300	600 x 300	300 x 300	300 x 300	300 x 300
Installed memory	35K	64K	32K	48K	32K	32K	512K
Parallel/serial interface	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Emulations supported	Canon BJ Epson LQ-860, Canon Extended Mode, IBM Proprinter X24E	Epson LQ-860, IBM Proprinter X24E	PCL 3+	PCL 3+	HP DeskJet, PCL 3+	HP DeskJet, PCL 3+	PCL 4
Windows driver	■	■	■	■	■	■	■
Control-panel buttons:							
Line-feed/Form-feed	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Emulation/print mode	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Typeface	■	■	■	■	■	■	■
Built-in/scalable typefaces included	5, 20 (on-disk)	5, none	6, none	4, none	6, none	5, 25 (on-disk)	5, none
Paper Handling							
Sheet-feeder	30 pages	1 page	15 pages	Optional (\$99)	15 pages	15 pages	1 page
Maximum rated paper weight (pounds)	28	27	24	24	24	24	N/A ²
Maximum rated paper width (inches)	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Media supported:							
Cut sheets/Envelopes	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Transparencies/Labels	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Card stock/Multipart forms	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Continuous-form/roll paper	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Technical Support							
Toll-free technical support	■	■	■	■	■	■	■
Telephone-support hours (eastern time)	8:00 A.M.-11:00 P.M. M-F, 11:00-6:00 Sat	11:00-7:00 M-F	8:30-8:00 M-F	9:00-2:00 M-F	10:30-7:30 M-F	8:30-6:00 M-F	10:00-7:00 M-F
24-hour BBS	■	■	■	■	■	■	■
Warranty	2 years	2 years	2 years	1 year	1 year	1 year	1 year

N/A¹—Not applicable. The product does not have this feature.

N/A²—Not applicable. The product uses only thermal paper, which is not rated by weight.

except the most demanding jobs, plain copy paper worked well, with no smearing or smudging. Monochrome printing costs a low 5 cents per page, while color printing costs a reasonable 23 cents per page.

On plain paper the 320's text was very clear with just a tiny bit of fuzziness.

The 320's economy mode—faster printing at 150 dpi—looked almost the same as 300-dpi mode. Presentation mode on glossy paper or transparencies produced clear, dark letters and no fuzziness. On transparencies and coated stock, colors were rich with no bleeding or irregularities. Color printing on plain paper was

fine for everyday work, though we preferred the richer saturation of the Canon's four-color output.

The 320's speed is about average for this roundup: It scored 70 cps on our Print Speed test and printed our two-page Microsoft Word for Windows test document in 1 minute 49 seconds. On our

The MultiPASS™ 1000 Document Processing System. It combines a laser-quality printer, a plain paper fax, a PC fax, a scanner, a personal copier and a telephone — all in one compact unit. MultiPASS Desktop Manager for Windows™ software is included to manage printing, faxing, scanning and telephone functions. Plus you can print and fax from the Windows applications you're using now. MultiPASS is everything you need next to your PC. Everything.



It's a Printer. The MultiPASS 1000 incorporates 360 x 360 dpi award-winning Bubble Jet™ technology. It has a front loading, adjustable 200-sheet letter/legal paper cassette. The easy-to-replace, self-cleaning BX-2 (BC-02) ink cartridge snaps into place. And the MultiPASS 1000 supports popular printer emulations from Canon, IBM® and EPSON.®

It's a Plain Paper Fax.

You get a 30-sheet auto document feeder for hard-copy faxing. Transmission speed is only 9 sec/page.*

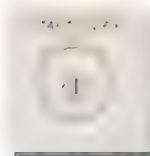
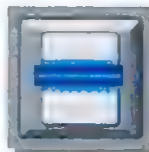


The MultiPASS 1000 uses Canon's Ultra High Quality (UHQ™) technology allowing it to scan photos in 64 halftone levels. Reception memory is 70 pages* and transmission memory is 50 pages.* What's more, you can send faxes even when your PC is off.



It's a PC Fax. With the MultiPASS 1000, you can fax directly from your PC at a speed faster than most faxboards. You can receive faxes while you're printing or when your PC is off. You can view faxes with zoom and full rotation, then save, print, forward or delete them. You can create a custom cover sheet and a virtually unlimited fax address book.

It's a Scanner. The MultiPASS 1000 offers TWAIN-compliant scanning with 200 x 200 dpi resolution and seven-level contrast control. It is compatible with most OCR software, enabling you to edit imported text without keying it in. And the 30-sheet auto document feeder lets you easily scan multi-page documents.



It's a Copier. You can make up to 99 laser-quality plain paper copies. The automatic document feeder holds

30 sheets and the front-loading, adjustable paper cassette holds 200 letter- or legal-size sheets. Canon's exclusive UHQ technology produces excellent copies of fine text and graphics.

It's a full-featured

Telephone. The MultiPASS 1000 telephone has on-hook dialing. You get a virtually unlimited telephone address book for point-and-click dialing, plus coded speed dialing to 80 locations. It has a Distinctive Ring Pattern Detector for use with special telephone company services. Plus it has a hold button with melody and an answering machine hookup.



For more information about the MultiPASS 1000, simply call 1-800-4321-HOP.



Introducing the MultiPASS 1000.
It's the six most important pieces of office equipment next to your PC.

CIRCLE 187 ON READER SERVICE CARD

*Based on CUTT #1 Chart (Standard Mode) © 1995 Canon U.S.A., Inc. Canon is a registered trademark and MultiPASS, Bubble Jet and UHQ are trademarks of Canon Inc. Windows is a trademark of Microsoft Corporation. IBM is a registered trademark of International Business Machines Corporation. EPSON is a registered trademark of Seiko Epson Corporation. Canon computer not included.

Canon



An Idea Without A Customer Goes Nowhere Fast.

At Advanced Micro Devices, we champion ideas that make a difference to our customers. Ideas we transform into microchips that make personal computer and communications systems perform better. As a result, AMD is Number 1 or 2 in the world in every market where we compete—microprocessors, communications circuits, flash memories and programmable logic. Which is not to say we've crossed the finish line. The truth is, we win when our customers win. That's why our 12,000 people worldwide are racing into the future with a singular vision: If it's a good idea. If it makes a difference. Run with it.



1-800-222-9323 Internet: <http://www.amd.com>

CIRCLE 017 ON READER SERVICE CARD

Monochrome Output Guides

The samples on this page show monochrome text and graphics output for each of the seven reviewed printers. We produced these samples in Aldus PageMaker 5.0 for Windows using each printer's highest resolution, and printed on the highest-quality paper recommended by each manufacturer.

Text and graphics quality was generally good across the board. Close inspection shows that the best text output belongs to the two ultraportable thermal-based units in our

roundup: the Citizen PN60 and Pentax PocketJet. In fact, the PocketJet's output could be mistaken for that of a laser printer. These units were less adept at gray-scale graphics, however, tending to lay down too much black in shadow area.

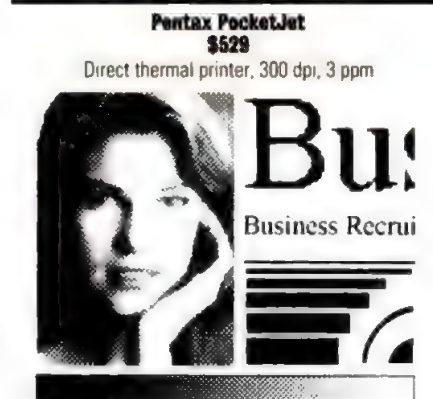
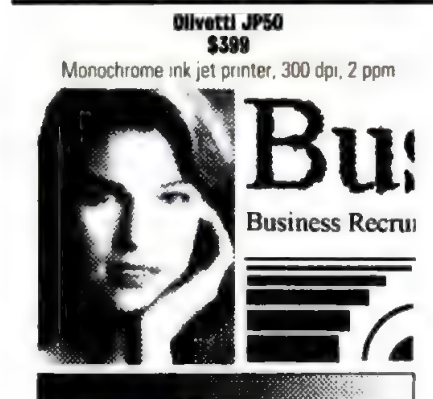
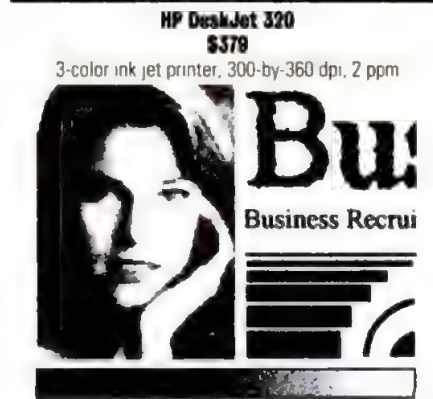
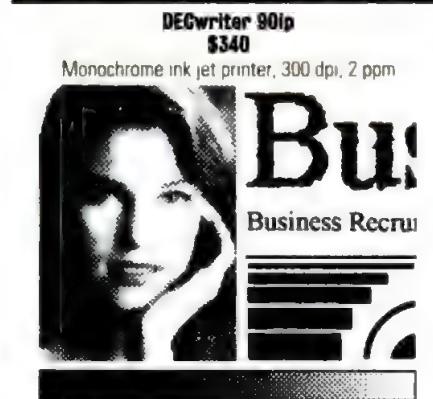
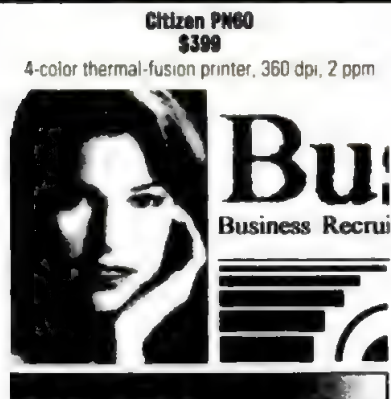
The other five printers, all ink jets, produced wider ranges of grays and hence better graphics output. But while the text quality was generally good, close inspection turns up the fuzzy overspray around characters that typifies most ink jet output.

Graphics output shows how well each printer reproduces photographs, or halftones. A better printer will retain detail in the shadow areas of the image. The samples are reproduced at the same size they were created.

Gray-scale output comprises a bar with a continuum of gray shades. Better printers will show smooth transition from dark to light.

Text output shows the quality of a serif font, both at the size it was created and enlarged five times. Preferable output will have clean edges on characters, with no bleeding or jaggedness.

Line art shows how well each printer reproduces lines and curves. The samples are reproduced here at the same size they were created. Look for crisp edges, especially on the curves.



DELAYED
DELAYED
DELAYED
DELAYED
DELAYED
DELAYED
DELAYED
DELAYED
DELAYED
DELAYED

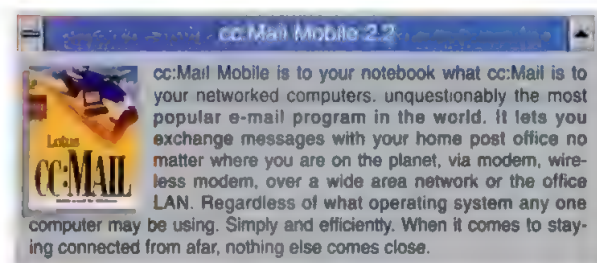
cc:Mail is
preferred by
business
travelers.

And heaven
knows they've
had time to
think about it.

Remember when your office was defined by a desk, a door, and four walls? Today, your office can be anywhere. A living room. A sidewalk cafe. Even an airport waiting area.

Where you can do one of two things. Wait. Or work.

With cc:Mail™ Mobile from Lotus®, you can be in instant touch with what's going on back at the office. This version of the world's best-selling and most honored e-mail lets you easily plug into your home post office from anywhere. Making time spent away from the office just as productive as time spent at the office.



With cc:Mail Mobile on your notebook computer, you can connect by modem, wireless modem, over a wide area network or the office LAN. And send messages, receive them, even access up-to-the-minute information through Bulletin Boards. And with over 150 new File Viewers, you can view files regardless of which application they were created on.

cc:Mail Mobile lets you store commonly used numbers and settings. Filter and preview incoming messages to screen out the unimportant ones. Even send and receive in the background while working in another program. No matter how far away from work your work happens to take you.



cc:Mail Mobile is the most important tool a business traveler can carry. Next to a toothbrush. Call 1-800-872-3387, EXT. A850,* to learn more or explore Lotus on the World Wide Web at www.lotus.com.

*In Canada call 1-800-GO-LOTUS. ©1995 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. Lotus and Working Together are registered trademarks and cc:Mail is a trademark of Lotus Development Corporation.

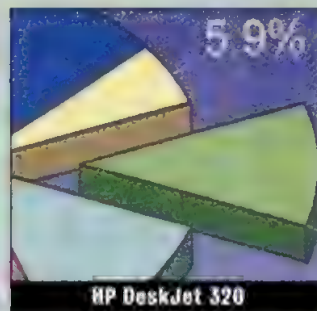
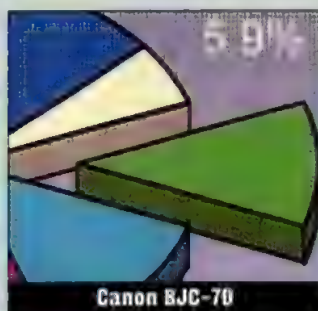
Color Output: Canon Fares Best

To evaluate the color capabilities of the three color printers that are in this roundup, we created a typical business graphic in Harvard Graphics for Windows. The page required 100 percent color coverage; a small portion of the page is reproduced here at the size at which it was created.

The Canon BJC-70, a four-color ink jet (cyan, magenta, yellow, black), showed the best color saturation and vibrancy, with barely visible banding. The HP DeskJet 320, a

three-color ink jet (cyan, magenta, yellow), exhibited even less banding. But colors were more vivid from the Canon.

The Citizen PN60, which uses thermal-fusion technology and a four-color ribbon, is intended to produce spot color only, not the full coverage this test demanded. Its colors are rich and well saturated, but banding and artifacts abound. It also required three ribbon cartridges and over 30 minutes to print the page completely.



Color Speed and CorelDRAW (monochrome) tests, the 320 took about twice as long as the competing Canon unit.

HP offers a one-year warranty that includes an exchange program as well as a \$49 three-year extension. HP doesn't have a 24-hour BBS, and technical support requires a toll call between 9:00 A.M. and 2:00 P.M. (eastern time) Monday through Friday.

Despite the HP DeskJet 320's lack of envelope feeding and the inconvenient cartridge switching, this versatile printer is a good candidate for desktop life with the added bonus of being able to travel. Output is fine, and the cost per page is low. Still, other transportable ink jet printers have surpassed the 320 in color quality, speed, and physical design.

Pentax Technologies Corp.

PocketJet



It's not surprising that the smallest portable printer in this roundup is also the most expensive. What is surprising, though, is that Pentax Technologies Corp.'s PocketJet (\$529 list, \$479 street) emerges as the printer to buy if portability is your prime consideration and you don't need

color—despite the fact that it requires thermal paper. In fact, the PocketJet is so quick and so portable, and turns out such good output, it's time for a new look at thermal printing.

Traditionally, thermal printing (used by common fax machines) has gotten a bad rap—and for good reason. The shiny slimy paper feels awful and tends to curl and yellow, and the print on the page can fade if the page is left in the light.

Pentax sells terrific cut-sheet thermal paper (\$7.99 for 100 letter-size sheets, \$9.99 for legal size), which is rated to hold the print image for up to five years if stored in a file. You don't have to run for a copy machine after using this printer: The paper feels and looks good. In a pinch, you can use the thermal roll paper made for fax machines (usually found as close as the front desk of your hotel), but once you've tried Pentax's cut-sheet thermal paper, you won't want to use roll paper except in emergencies.

You get more for your money with the diminutive PocketJet than you get with other portables, including an AC adapter/charger, a nickel cadmium battery, a proprietary parallel cable, a carrying case with a pocket for the quick-reference guide, and 100 sheets of paper. This printer uses no consumables other than paper, so the cost per printed page, no

matter what density, is at most 8 cents for letter-size paper or 10 cents for legal.

The PocketJet measures only 1.2 by 10.0 by 2.2 inches (HWD), making it the least bulky printer in this roundup. Even when you add in the AC adapter, the total volume is only 43.6 cubic inches. The printer in its carrying case plus the battery, AC adapter, and parallel cable weighs less than 2 and a half pounds. Of course, you'll want to carry at least a few pieces of the special cut-sheet thermal paper.

You also must use a proprietary cable with the PocketJet; the auto-sensing I/O port can use either the proprietary parallel cable or an optional \$25.99 serial cable. Setup is easy. You connect the cables, turn the printer on, and feed paper one sheet at a time into a slot. As long as you use both hands and hold the paper straight, the rollers grab the paper and pull it to starting position, at which point you can let it go. Unfortunately, you cannot print envelopes. The PocketJet is PCL 4-compatible, and it uses the HP LaserJet IIP driver for Windows print jobs.

As with the Citizen PN60 thermal printer, which is also reviewed here, text output was superb, rivaling laser quality. Characters were smooth, dark, and perfectly formed; the 300-dpi graphics

Portable Printers

showed a better range of grays than came from the Citizen. The only adjustment you need to make is via a density dial on the side of the printer.

Rated at 3 pages per minute, the PocketJet lived up to its name in Windows application text printing, producing our Microsoft Word for Windows test document in just 56 seconds—the best score in the roundup. It was second-fastest on the DOS-level Print Speed test (73 characters per second), and it turned in respectable times when producing monochrome graphics.

The PocketJet has a one-year warranty with an exchange program, and extended warranties are available (\$49.95 for two years). Technical support, 10:00 A.M. to 7:00 P.M. (eastern time) Monday through Friday, requires a toll call. Its speed, excellent print quality, and small size earn the PocketJet top honors as the take-me-anywhere printer, as long as you won't miss color-printing capability on the road. With the recommended cut-sheet thermal paper, the PocketJet may also be the printer that takes the smudge away from your impression of thermal-paper printing. □



▶ FACT FILE

PocketJet

List price: \$529; additional nickel cadmium battery, \$37.99, 100 sheets letter- or A4-size cut-sheet thermal paper, \$7.99, 100 sheets legal-size thermal paper, \$9.99, serial cable, \$25.99

In short: Pentax's very fast PocketJet is the lightest and most portable printer we tested—and it has the best text printing quality. You must use thermal paper fed one sheet at a time, though, so you'll want to use the printer only for low-volume monochrome print tasks on the road.

Pentax Technologies
Corp., 100 Technology
Dr., Broomfield, CO
80021, 800-543-6144,
303-460-1600, fax,
303-460-1628

450 on reader service card

SUITABILITY TO TASK

Portability	Excellent
Text printing	Excellent
Graphics printing	Good
Paper handling	Poor



Includes
Internet Access
Software!

COMPLETE
TEXT OF
PC MAGAZINE,
OCTOBER 1993
TO
OCTOBER 1994

INCLUDES
Winstone

TECHNICALLY EXPLICIT MATERIAL ENCLOSED

PC Magazine CD—the
most innovative PC
tool ever developed.

Now 30% off when you
subscribe!

It's one thing to read
about cutting-edge
technology. Now, with
PC Magazine CD—the
on-screen companion
to PC Magazine—you can see, hear and interact with it.

Just one click lets you: Walk through the newest software suites... download PC Bench 9.0, Winbench 95 and Winstone 95... pull up data and results not available in print or online... experience exclusive multimedia product demonstrations... get working samples of real applications to run on your system... access everything ever published in PC Magazine during the previous 12 months.

All this at our lowest-time-ever rate of just \$49.95 for four power-packed releases—30% off the single-disc price! Call right away to start your subscription to PC Magazine CD. There's nothing else like it on the market today!

Call: 1 800-335-1195

Mention Priority Code 8FAA

P.O. Box 59494 • Boulder, CO 80332-9494

U.S. SAVINGS BONDS FOR EDUCATION GROW ALMOST AS FAST AS KIDS DO.

Buy U.S. Savings Bonds — for half their face value — where you work or bank. If you keep them five years or more, you'll earn competitive, market-based rates or a guaranteed minimum rate, whichever is higher.

For current rate information, call 1-800-4US BOND • 1-800-487-2663



A public service of this magazine

Good thing you waited to upgrade.



Introducing the moderately priced and very, very powerful OL810e personal printer.

600 x 1200 dpi resolution.

8 page per minute print speed.

5-year limited LED printhead warranty.

Windows™ compatible.

250 sheet legal/universal paper tray standard.

Upgradable to 850 sheet capacity.

45 resident scalable fonts.

2 MB memory upgradable to 34 MB.

Only months ago, upgrading to a business laser printer with this kind of speed and this kind of resolution would have been very expensive.

And worth it.

Until now.

The new OL810e LED page printer.

Compact, reliable.

More dots per inch for better looking output.

More pages per minute so the job gets done faster.

And less: hundreds of dollars less than you'd expect.

For a dealer near you, call 1-800-OKI-TEAM, ext. 578 (U.S. or Canada).
For Fax Back specifications, call 1-800-654-6651, ask for document 1005.

YOUR BUSINESS HAS NEVER LOOKED BETTER.™

© 1995, Okidata Corporation. OKIDATA, OKI, and OKI America, Inc. are registered trademarks of Okidata Corporation. All other trademarks are the property of their respective owners.

The New
OKIDATA
a Division of Okidata, Inc.

OL810e Personal
Power Printer.



SHARE THE WEALTH

In business, your contacts are among your most valuable assets. Today's networked contact managers share contact data and history with your workgroup, manage group scheduling, and sync contact data remotely.

By Kevin Reichard & Kathy Yakal

As networking becomes ubiquitous in the business marketplace, application software must serve many masters. That's especially true of today's contact managers, which increasingly need to function equally well for workgroups and individual users.

In fact, this emerging emphasis on the workgroup represents the biggest change in the contact-manager category since our last roundup of this genre two years ago. Traditionally, a contact manager was considered good if it was quicker than a Rolodex for pulling up a record and offered more detail. But the network dimension adds important capabilities—and responsibilities—to the list, such as group scheduling, varying security levels, and maintaining data integrity in the face of multiple users.

That's why we put Windows-based work-

group contact managers to the test for these reviews. Our criteria for selecting these packages include shared contacts (typically, in a centralized database), the ability to automatically log contact history, and the ability to generate individual calendars and task lists. Packages that met these criteria were Ace for Windows 3.0, ACT! 2.0 for Windows, Action Plus for Windows 1.51, Commence 3.0 Personal

Workgroup Contact Managers

► IN THIS REVIEW

Products reviewed:			
<i>Ace for Windows 3.0</i>	251	<i>Janna Contact 2.0</i>	263
<i>ACT! 2.0 for Windows</i>	252	<i>Maximizer 3.0 for Windows</i>	269
<i>Action Plus for Windows 1.51</i>	254	<i>SuperOffice 3.0</i>	270
<i>Commence 3.0 Personal Information Manager</i>	257	<i>TeleMagic Enterprise for Windows 1.5</i>	272
<i>GoldMine for Windows 2.5a</i>	260	<i>Tracker for Windows 2.0</i>	274
		<i>WinSales 2.1</i>	275

Information Manager, GoldMine for Windows 2.5a, Janna Contact 2.0, Maximizer 3.0, SuperOffice 3.0, TeleMagic Enterprise for Windows 1.5, Tracker for Windows 2.0, and WinSales 2.1. Most of these products can also—to one degree or another—do group scheduling and remote data synchronization for users on the road. Info Accelerator, from Baseline Data Systems, arrived too late for review; we cover it in a sidebar.

To get a sense of how a good personal information manager (PIM) stacks up against the contact manager field, we looked at Ecco Professional, one of the two Editors' Choice in our most recent PIM roundup. (The other was ACT!, which we review here.) In another sidebar, we look briefly at four other net-

worked Windows and OS/2 PIMs (CrossTies, DayTimer Organizer, Lotus Organizer, and Relish).

Finally, there are a few related products that fall slightly outside the focus of this story but nevertheless offer some group contact-management potential. At the high end, IntelliAgent Control, from Veritas Technologies (214-387-1812), leverages the power and customizability of Lotus Notes to provide a true enterprise contact-management solution. At the low end, "Microsoft Office Compatible" METZ Phones 5.51, from METZ Software (206-641-4525), covers the phone-and-address part of workgroup contact management for under \$50 per user (promotional pricing until November 30, 1995). The version of Microsoft

Schedule + slated to ship as part of Microsoft Office for Windows 95 (800-426-9400) will have expanded information-management capabilities.

MANAGING CORE CONTACTS

To be an effective workgroup contact manager, a product must first meet the requirements of individual workgroup members. Let's take a look at what makes a good contact manager.

First, it must have a solid foundation: a database manager whose record formats contain enough standard and customizable data fields to satisfy users with the most demanding needs for detail—without overwhelming the eye and mind with *too* much information. Developers have recently found ways to selectively display multiple layers of contact data while keeping screen layouts readable. GoldMine, for example, uses file folder tabs to tuck away contact data that doesn't need to be on-screen all the time.

Further, it's often necessary to link individuals in your database. Say you normally talk to an organization's purchasing director, but when she's away

Suitability to Task

Contact Management software has continued to evolve since our last roundup (August 1993). At that time, most programs still ran under DOS, and workgroup computing was only starting to emerge. Because most contact-management programs were single-user programs, remote computing—the need to exchange data while working away from the main office—was barely an issue.

We based our testing for this review on the script from the 1993 story but updated it to reflect the growing emphasis on workgroup and remote computing as well as the move to Windows. (Few of the programs reviewed in 1993 ran under Windows, but this year, all 11 products covered are Windows-based.) Don't be deceived by our primary focus on workgroup capabilities; we believe that behind any good workgroup product is a solid program for the single user.

At the heart of any good contact-management application is a strong **contact database**. We evaluated

each product's ability to import data from a variety of sources into both new and existing databases; we also tested exporting capabilities. We assessed the types of information that the user could store and the user's ability to customize the database. Other operations we evaluated in this task included the efficiency of adding, searching, and deleting records, and the program's logging and reporting capabilities.

The ancillary task of **personal scheduling** includes setting up and tracking meetings (both one-time and recurring), tasks, and phone calls. We also looked at the ability to set up scripted telephone conversations and automatic sequences of events and reminders.

Beyond tracking appointments, the contact manager must also help users with contact **correspondence**. We looked at the programs' abilities to send and track letters and mass mailings using a built-in

word processor if available or by transferring data to one of the popular Windows word processors. We also looked at correspondence via fax and electronic mail.

To be an effective **workgroup** product, a program must provide strong security, permitting some information to be shared with others, while designating some data as private. We also looked at the program's use of e-mail, whether built-in or external, and the program's ability to act as a group-scheduler.

Finally, we evaluated the programs' **remote** capabilities, including the ability to exchange data with one or more separate databases and the ability to work with a subset of a master database.

Where a product had an **add-in** for remote data synchronization, we tested that add-in and reported the results separately.

SUITABILITY TO TASK

	Power	Ease
Contact database	Poor	Poor
Personal scheduling	Fair	Fair
Correspondence	Good	Good
Workgroup	Excellent	Excellent
Remote	N/A	N/A

N/A—Not applicable: The product does not have this kind of feature.

Remote Add-In

	Power	Ease
Workgroup	Poor	Poor
Remote	Fair	Fair

you talk to her assistant at a different extension. Good contact managers offer ways to move quickly to related records when the need arises. Maximizer has always handled this well by letting you link unlimited contacts to each central client.

More and more, people who are setting up contact managers already have contact information stored in another product (whether it's a flat-file database or another contact manager). Most products we reviewed import databases in ASCII or .DBF format or both; most simplify that process with field-mapping features that let you match the new program's field structure to the existing database. The best products go further, importing directly from other contact managers: GoldMine, for example, has templates for direct import from such products as ACT!, Lotus Organizer, and TeleMagic.

MORE THAN A PHONE BOOK

Of course, a good contact manager does much more than manage contacts. An up-to-date catalog of features certainly includes a calendar for scheduling meetings and maintaining to-do lists. And you should be able to auto-dial phone calls, as well as record the outcome of all calls—regardless of who did the dialing—so you can plan any necessary follow-up. Further, with either an internal word processor or a link to an external word processor (ACT! and Maximizer offer both), you should be able to send individual correspondence or mass mailings quickly and easily. Today, of course, much correspondence is handled by fax, so, ideally, your contact manager should let you easily create, merge, and transmit faxes. Finally, all such tools should be integrated; you shouldn't need to switch from a contact screen to a calendar to schedule a meeting.

Our Contributors: BARRY BRENESAL is a contributing editor to *Computer Shopper* and a freelance writer who focuses on information, memory, and project-management software. GREGG KEIZER is a freelance writer who focuses on financial-management software for personal and business use. KEVIN REICHARD has written 15 books for MIS:Press on various operating-system topics. NELSON KING is a software development project manager and computer journalist. KATHY YAKAL is a journalist who has covered the PC industry since 1983. SARAH ROBERTS is a staff editor and YVONNE KOULOUTHROS is an editorial researcher at *PC Magazine*. TED STEVENSON was the senior associate editor in charge of this story.

GoldMine for Windows 2.5a

Times change and software evolves: Today, any contact manager worthy of the name is a workgroup

tool, sharing the wealth of accumulated contact information, across the enterprise, among all the people whose business is furthering your organization's business. As a base for workgroup operations, the contact manager can do more, too: By managing personal and group calendars, it can take much of the effort out of arranging meetings—still the lifeblood of many organizations. And as, nowadays, the workgroup includes many who work away from the central offices, contact managers should be able to easily exchange and update both contact and schedule information between remote users and the central database.

Our Editors' Choice, GoldMine for Windows 2.5a (designed from the get-go as a networked product), has the tools to handle contact and calendar information from the personal desktop all the way to the distributed enterprise: Using tabbed folders in its highly customizable contact-record interface, GoldMine can store a wealth of contact data, displaying it in digestible chunks. Both data entry and searching in GoldMine are quick and flexible, and the product's data-import features are powerful—if not user-friendly.

Effective contact management means capturing large amounts of detail: The more carefully you document your activities with your contact, the more complete—and therefore, useful—your contact histories will be. Pull up a contact's

For group scheduling, the package supplements its comprehensive personal calendaring features by integrating with Microsoft Schedule + (sold separately). GoldMine manages meeting-related messaging via its own e-mail or Microsoft Mail. And the program has privacy options that let you keep personal information out of the public eye.

GoldMine's data synchronization allows changes to be reconciled with multiple distributed databases, either across the LAN or via e-mail. Gold-Sync, the recently released extra-cost add-in, automates this and adds the ability to synchronize schedule data.

ACT! 2.0 for Windows, which has long dominated the contact-manager field, remains a superb personal product. It is elegant and eminently usable, and for this we give it honorable mention. While its workgroup capabilities have clearly evolved grown, both its group scheduling and its data synchronization functions fall somewhat short of the mark set by GoldMine. Tracker for Windows 2.0, while in need of some interface smoothing, has all the power you'd want—for either personal or workgroup use; its data reconciliation features are particularly effective and easy to use.

record and with a few clicks of your mouse, you should be able to see if you need to call, write, or schedule future meetings. You can prepare for conversations by browsing through the history to refresh your memory on past interactions. Naturally, you will want a product that does as much of this as possible automatically (although in many cases you will need to supplement automatic record-keeping with manual notes). Besides storing this valuable background with each record, good contact managers keep master lists of work that is pending to remind you of what needs to be done and when.



E-MAIL FOR PEOPLE THINGS TO DO, PLACES AND PEOPLE



*Schedule+'s alarm clock
reminds you of meetings,
deadlines, anything.
So you'll stay organized
and save time. And never
miss another meeting.*



In other words, people like you. People who need more time. And fewer headaches. Microsoft® Mail lets you do more, while keeping you connected, whether you're down the hall or down under on business. No wonder Microsoft Mail is the best-selling LAN-based mail product in the world.

For a start, Microsoft Mail works perfectly with what you already have. Whether you're in Windows® 95, Windows NT™, MS-DOS®, on a Mac®, or OS/2®. And you can send mail without exiting the applications you're working in. And you can send faxes right from your word processor. Whether you're in Microsoft Word, Microsoft Excel, Lotus® 1-2-3® or WordPerfect®.

WITH



*With Mail Remote,
you don't need to be in
your office to keep in touch.
And with wireless service,
you don't even need
to be near a phone.
You can log in anywhere.*

TO GO E TO SEE.

How can Microsoft Mail save you time? Microsoft Mail has smart, sensible symbols and online help that make learning to send and receive mail easy. Even messages that include graphs, pictures and sound. You can save even more time by adding features that are just as easy to use as Microsoft Mail. Like Schedule+, the best-selling scheduler for Windows. It helps you manage your calendar and reminds you of meetings and deadlines. It even shows you when everyone is free. So you can schedule meetings without a lot of legwork. Microsoft electronic forms let you speed up expense reports, vacation requests and other important forms through your office at the speed of light. And with electronic forms you can track them easily.

Finally, with Mail Remote you can stay connected and work just like you do in your office when you're on the road. Not only that, it can also save you money. Just read the important messages, then let Mail Remote respond automatically when transmission rates are lowest.

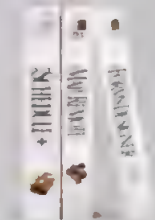
No other mail system is easier to use or easier for your IS people to administer. Or engineered like Microsoft Mail to take advantage of new information exchange technologies. To find out more, just add one more thing to your to-do list: Call (800) 871-3271, Dept. Q4R, and ask for our free Microsoft Mail information kit.



HIGHLY INTEGRATED WITH
MICROSOFT OFFICE

EASY TO ADD FAX AND
INTERNET CONNECTIVITY

EASY TO INSTALL AND
EASY TO ADMINISTER



Microsoft

WHERE DO YOU WANT TO GO TODAY?™

Workgroup Contact Managers

MANAGING GROUPS

Most contact managers let you do simple searches based on indexed fields to find a single person or everyone in the same zip code, for example. Most of the products reviewed here also let you build ad hoc groups based on matching characteristics (people with birthdays in May, perhaps). GoldMine's Profiles are a good example of this: You can add an unlimited number of user-defined fields and search them. ACT! lets you create groups that don't even have a matching field but that are somehow related, like the members of your carpool. You should be able to create groups either permanently or on the fly, using the product's sorting tools.

Today's contact managers are more automated than ever before. Most of the products we evaluated offer either a macro recording/playback function or a full macro language. For example, Maximizer's MaxAction (an alternative interface in the core package) lets you define rules for follow-up with contacts—setting an alarm for a letter a week after a call, and another letter two weeks later, perhaps.

WORKING THE NET

Organizing contacts for a single user is one thing; organizing them for a group is another. That's why we tested these contact managers in networked as well as in single-user configurations. In the case of the network, we set up a ten-user workgroup running under NetWare, with the workstations set to run both directly off of the network server and on local installations. Where available, we also took a look at add-on products that extended the network, whether adding dial-in capabilities for remote users (as with ACT!'s MobileLink) or synchronizing multiple, distributed contact databases (as with GoldMine's GoldSync).

The shared database is both the most basic and the most powerful feature of group-enabled contact managers. At the simplest level, it saves untold time by making *static* contact information (address and phone numbers) available to all without duplicating the effort involved in compiling it. More important, though, is workgroup access to *dynamic* contact information—the history of all interactions between your organization and the person

in question. In the case of dynamic history, it's generally prudent to make such information available selectively (with differing levels of access). Individuals should also be able to make private entries in the database (either records or fields).

A shared calendar lets anyone set up meetings with other workgroup members after searching the appropriate individual calendars for open time. (Again, individuals should be able to make totally private calendar entries.) Ideally, the contact manager should be able to schedule meetings automatically, via e-mail or instant

*The shared database is both
the most basic
and the most
powerful
feature of
a group
contact manager.*



on-screen notification. Add to this the ability to synchronize databases and calendars with remote users, and you can see the power the network brings to contact management.

AND MUCH MORE...

We found that some packages, such as GoldMine and Tracker, provided all of these services via the network, while others, such as Ace, viewed the network as little more than a means to share a central database. Here are two more key features that boost a contact manager's ability to create synergy in the workgroup:

- The ability to organize workgroup members into groups. This makes it easy to distribute documents and notes via e-mail; just specify the appropriate user group and send away. It's also a precursor to setting up security/access levels (as discussed above). For instance, you should be able to define *Senior Management* as a user group, giving its members access to certain records (or perhaps only portions of certain records) and limiting the distribution of sensitive documents to them.

- Data replication and synchronization, where remote users can make changes to a set of contacts and then integrate those changes to the central, shared database. It shouldn't require a network administrator to make such changes. Tracker, for example, contains a nifty utility that lets laptop users automatically synchronize their data. (It's vital, of course, to maintain data integrity, even when many users are making such changes.)

MAKING CHOICES

As a group, the eleven products we tested offer a remarkably diverse spectrum of scales, levels of complexity, and approaches to contact management. On the one hand, with packages like GoldMine and Maximizer (and their respective add-ons, GoldSync and MaxExchange, which was not yet available when we conducted our testing), contact management is now reaching the enterprise level by synchronizing multiple databases across a wide-area network and subsequently placing these products squarely in the realm of the network administrator. Other packages, such as Janna Contact and SuperOffice, seem better suited for small offices that need a variety of contact and scheduling tools but don't need the industrial-strength options. And, even though this product category has its roots in sales departments, not every package expressly supports sales features like telemarketing scripts. (Janna, for one, eschews the sales paradigm.) Consider this, too, as you read the reviews.

Finding an interface that appeals to you may not be difficult, but if you're a system administrator, you'll have to consider the needs and proficiency levels of your workgroup members. The issue of usability may actually be more difficult to resolve than zeroing in on the right set of features for your network's contact management requirements. Fortunately, the panoply of LAN-based contact managers reviewed here also represents wide variations of both elements. Whether your organization deals in sales, public relations, accounting, the law—or any other profession that must sell its services—a workgroup-based contact manager, used faithfully, should enhance your results by automating and tracking interaction with your customers.

Open doors you never knew existed.



The White House



The Ontario Science Center



The Louvre



NASA



Cardiff University
Movie Archives, U.K.



The Virtual Flyshop



The British Royal
Treasury



The Israeli
Law Library



Chicago
Mercantile Exchange



The Office of the
Secretary of Defense



The BBC London



The IRS



The Slovakian
Document Store



The Paris Metro



Goteborg University,
Sweden



The Astronomical
Museum, Bologna



New Zealand
Symphony Orchestra

get 10 free hours* of Prodigy
with easy Internet access!

32919/8039

name _____

address _____

city _____

state _____

zip _____

signature _____

phone number () _____

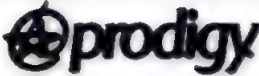
we'll send you Prodigy software for Windows*

or call 1-800-PRODIGY ext. 642

This offer includes first month's membership fee and 10 free hours of usage in the first month. Usage beyond the trial offer will result in extra fees. Some features charged for separately. Credit card required. Phone charges may apply. Limited time offer subject to change and orders are subject to acceptance. Please allow approximately two weeks for shipment of your PRODIGY software. The offer is available to new members only and is limited to one person per household.

 **prodigy**

whatever you're into



- Leader of Doomday Cult & M Supporters Arrested
Bomb Splashes at Tokyo City Hall: More Violence Fanned
80,000 Caps Mobilized Nationwide in Japan
- PRODIGY Beats AOL & Compuserve in Competition
Learn How We Won Internet World's First "Online
Service Shoot-out," Then Try Our Web Browser
- Start Planning Your Family Vacation at Your Keyboard
This is only, Our Web Travel Home Page Features CA & FL
Tourist Info Ask PRODIGY & Internet Billers for Tips
- Tonight at 8pm ET, Get Live Online With Tom Snyder
Host of THE LATE LATE SHOW Starts Taking Questions
at 830pm ET: Ask About His 30-Year Broadcast Career
- Enter the Father of the Year Contest Now
You Could Win Great Prizes for Dad
From JCheney and American Greetings

- Communities
- Internet
- News & Weather
- Business & Finance
- Sports
- People Connection
- Entertainment
- Marketplace
- Computers
- Travel
- Just For Kids
- What's Hot

The new Prodigy features a whole new look that makes it easier to find whatever you're into.*

The best Internet access

While there are plenty of online services out there today, there's only one that gives you the easiest access to the Internet. And that's Prodigy. During a recent comparison test at the spring *Internet World* show, Prodigy was unanimously voted the best for Internet access.

Build your own home page

Prodigy is now also the only online service that allows you to create your

own home page on the Internet's World Wide Web. That way anyone surfing the Net can find out more about you, what you do, your interests, or even where you think you can find the best Bloody Mary.

Explore your interests

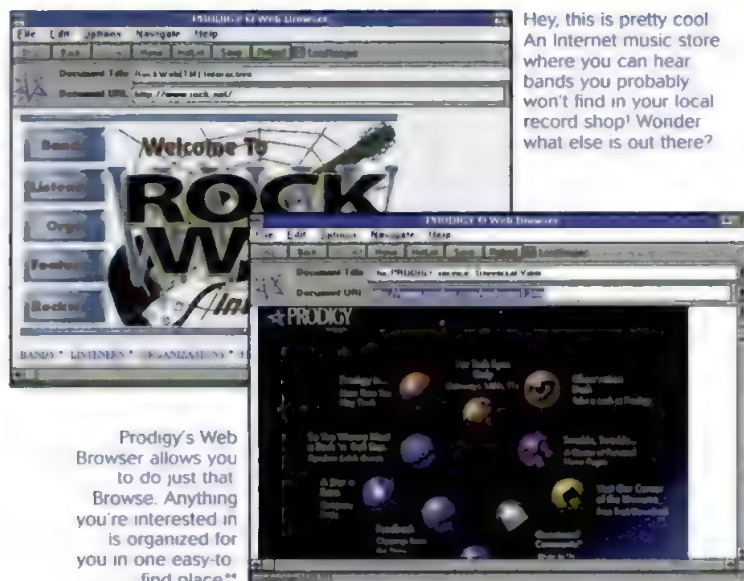
Or you could choose to explore any of your other interests. Music. Investments. The mating ritual of the three-toed tree sloth. Because whatever you're into, we've got it.

To get your 10 free hours

CALL US AT 1-800-PRODIGY ext. 642, email us at freetrial@prodigy.com or download the software directly from our World Wide Web location, www.astranet.com (check your screen for our icon first; you may already have Prodigy installed). After your 10 free hours, Prodigy is only \$9.95 a month for 5 hours, with no extra charge for Internet access.

CALL 1-800-PRODIGY (ext. 642)

get 10 free hours to explore the Internet



Hey, this is pretty cool An Internet music store where you can hear bands you probably won't find in your local record shop! Wonder what else is out there?

Prodigy's Web Browser allows you to do just that Browse. Anything you're interested in is organized for you in one easy-to-find place.**

*New look of Prodigy scheduled for summer 1995. **The Prodigy Web Browser is available only for Windows.* Prodigy is a registered trademark of Prodigy Services Company. Windows is a registered trademark of Microsoft Corporation. Other names are service marks or trademarks of their respective owners. ©1995 Prodigy Services Company. All rights reserved.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL/PERMIT NO. 98/JOHNSON CITY, TN

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. BOX 8667
GRAY, TN 37615-9967



whatever you're into



Workgroup Contact Managers

Sante Fe Software

Ace for Windows 3.0

BY BARRY BRENESAL

Sante Fe Software's Ace for Windows, Version 3.0, demonstrates once again that porting a DOS-based information manager—in this case Biz*Base 2.22—to the Windows environment isn't quite the same as developing a new product. Times change, and though Ace is unquestionably a Windows product, it hasn't met the needs of a corporate, LAN-based, information-sharing environment with great success.

As a standalone contact manager, Ace (\$49.95) definitely has its strong points: It's easy to install, with hardly any pre-configuration needed. The tech support and context-sensitive on-line help are excellent, though the documentation is problematic; it crams far too much detail into its 350-plus black-and-white pages, with hundreds of cute but totally irrelevant graphics. Ace also doesn't provide a start-up guide or introductory tutorial.

Ace's interface clearly divides contact-record fields, scheduling information, notes, menu, and toolbar. The product doesn't include macros, but third-party

products like Softblox's SmartPad can compensate for this deficiency.

SOUND BASICS

Icons at the bottom of Ace's contact screen instantly tell you whether a particular record is part of a predefined group, a hot prospect, or someone with an available history file. Updating contact information is as simple as double-clicking on a field and typing. Scheduling events is similarly easy in Ace, and distinctive event icons help identify activities at a glance. You can't drag-and-drop between the main contact record view and the calendar

Ecco Professional 2.0: Can It Manage Contacts?

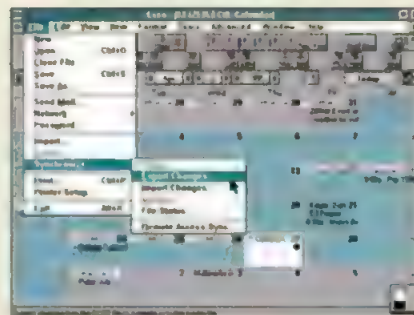
By Gregg Keizer

A contact manager often works well as a PIM (personal information manager) pinch hitter, but when a PIM—even a great one—steps to the plate, it usually falls behind the count quickly. Net-Manager's \$279 Ecco Professional 2.0 (ten users, \$1,550), one of the most flexible and powerful PIMs around, is a terrific repository for names, numbers, dates, and almost any other kind of information. But its flexibility puts it at a disadvantage when compared with contact managers. The next update promises to be a much stronger contact manager.

Getting Ecco ready for the workgroup is relatively simple, and administration takes little effort. Workstation installation is made even easier with the creation of Auto Network Install disk sets. Ecco's interface is decidedly different. Ecco treats each piece of information as an object in a hierarchical outline—a boon for flexibility and for convenience. And a slew of tools lets you view data in almost any fashion.

CALL ME, LET'S HAVE LUNCH

Although Ecco's phone book may look unusual, it's more solid than most. Adding contacts, whether from scratch or by importing, is easy. But Ecco's contact database requires considerable customization to bring it up to a par with the best contact managers. Ecco doesn't log calls automati-



Ecco 2.0's information and scheduling skills extend easily to groups.

cally, but one click drops another outline item under the contact and includes a time stamp.

Searching is less impressive; Ecco lacks structured or complex queries. Database reconciliation is outstanding, though. Changes can be transmitted via e-mail, the network, or on-disk.

Ecco's scheduling functions are first-rate, with recurring appointments, drag-and-drop changes, and nifty linking of contacts with calendar items. Daily, weekly, and monthly views can be filtered to spot specifics, and tasks appear on the calendar.

Workgroup time and task management is just as slick. Through integration with Schedule +, Ecco searches for free time among attendees, handles messaging through CMC- or VIM-compliant e-mail, and lets you delegate responsibilities to others. Ecco also lets a group share phone books, calen-

dars, and other information, and lets you lock records and designate specific items as private.

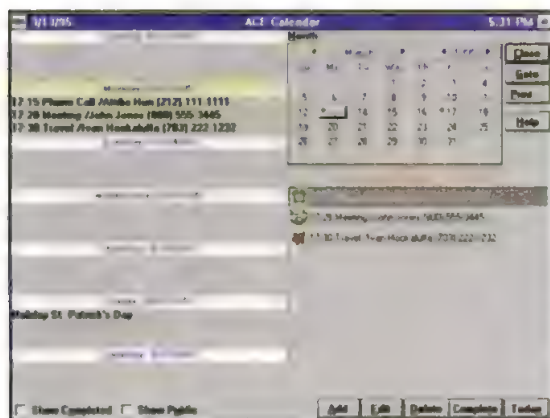
FANTASTIC FREE FORM

Ecco's ability to record free-form information surpasses that of even the best contact managers, but its reporting functions, history logging, and correspondence tools are weak or nonexistent, making the current version a poor choice as a contact manager.

Ecco Professional 3.0, which we didn't test but examined in a prerelease version, fine-tunes the interface, adds numerous minor tools, and includes several crucial contact-manager-type features. The phone book form is completely customizable. A new correspondence manager links contacts with Word for Windows, WordPerfect, and Ami Pro; creates letters for e-mailing, faxing, or printing; logs the correspondence; and places the filename under the contact so it can later be launched from Ecco. And the product's new query function conducts sophisticated searches. This version should be available by the time you read this and for about \$100 less.

Ecco Professional, Version 2.0, can't match the top contact managers in several areas, but it's a superb personal and workgroup information manager. If you need something with a substantial contact-management spin, however, wait for Version 3.0. □

Workgroup Contact Managers



Ace's graphical calendar is attractive and easy to use but lacks drag-and-drop links to its contact records.

view, though, which puts a real dent in Ace's otherwise considerable ease of use.

On the other, hand, Ace handles data import/export well. The dialog box for this is as transparent as Ace's other main interfaces, and we didn't have any problems during or after transfer. (A separate import/export utility is enclosed to translate ACT! files into Ace.)

Ace's HotSheet—a customizable list comprising your weekly schedule, daily appointments, clients to phone, additional important phone numbers, a prioritized to-do list, and tasks given to others—is a promising feature. The HotSheet prints to any size paper and a host of address- and appointment-book formats. Unfortunately, printing them is the only way to see them; they can't be viewed on-screen.

ACE-ING THE SEARCHES

The area in which Ace most truly shines is its search capabilities. The product supplies nine indexed lookup fields by default and allows you to define a further five. You can create and save an unlimited number of additional searches using the intuitive Query by Example screen. Right-click a field and type in words, numbers, and Boolean expressions to perform a quick search. (And Ace's searches are blindingly fast.)

Ace's Advanced QBE Definition screen is better still, allowing you to use a wide range of functions on Ace's 72 fields. But Ace lacks a QBE Wizard to walk you through the advanced query creation process, and on-line help is no substitute.

You also don't get the sense that Ace's developers understand that contact managers have moved from being standalone

products to become LAN-based tools that facilitate the flow of information within an organization. Ace has no e-mail capabilities, for example, let alone group scheduling. You can't use Ace to invite other users to a meeting, or even check their personal calendars for free time. You can assign task to other users but can't make a task mandatory. This product even lacks rudimentary record locking for the times when two or more people simultaneously edit a single record across the network.

Security—a vital aspect of multiuser applications—is minimal in Ace. It lets you designate a given database as public or private, but that's all. There is no group access via an administrator, and users can't be restricted to a specific set of commands as in GoldMine.

Similar concerns apply to Ace for remote use. The base program has no remote synch capabilities, and while Santa Fe apparently offers Ace Remote to handle this job, the vendor didn't provide it to us for testing.

Ace is basically Biz*Base in graphical clothing. Though attractive and stylish, Ace is still catering only to Biz*Base's established clientele for a standalone contact manager. As a workgroup solution, it's still a ways from being successful.

► FACT FILE

Ace for Windows, Version 3.0

List price: \$49.95 **Requires:** 8MB RAM, 4MB hard disk space **In short:** Ace is a good standalone information manager with superior querying capabilities, automated logging, and strong import/export. The interface is attractive, and it's extremely fast. But the lack of networking, remote control, and drag-and-drop are major drawbacks in this electronic information age.

Santa Fe Software, 16855 W. Bernardo Dr., #110, San Diego, CA 92127, 800-833-8892, 619-673-5313, fax, 619-673-7399.

See on reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Good	Good
Personal scheduling	Fair	Fair
Correspondence	Good	Good
Workgroup	Poor	Poor
Remote	N/A	N/A

Symantec Corp.

ACT! 2.0 for Windows

By KATHY YAKAL

For years, ACT! has dominated the contact management field with its unbeatable combination of usability and features. It virtually defined the contact management genre, earning two *PC Magazine* Editors' Choice awards along the way, and as a single-user product, it remains a front runner. ACT! 2.0 for Windows (\$199; five users, \$599) offers a generous framework for your contact database, flexible scheduling options, detailed logs of your contact interactions, and fine tools for handling written correspondence and faxes. Sadly, the product hasn't kept up with its competitors in workgroup functionality, falling behind several products.

Whether you're a solo user or a network administrator, you'll find installation and configuration fairly trouble-free. ACT!'s database-import-mapping program is easier to use than GoldMine's, and it supports multiplatform LANs, but configuration flexibility is limited. You can import databases in standard dBASE and ASCII and directly import from several other information managers, such as Lotus Organizer and Polaris PackRat.

Perhaps ACT! for Windows's biggest strength is its out-of-the-box usability. Written and on-line help are unnecessary in many cases, because the menu structure is logically organized and uses simple, descriptive words and phrases. Navigational icons are a bit more cryptic, though. To keep the contact screen uncluttered but comprehensive, an icon toggles between two screen views, each of which contains a generous number of standard (but modifiable) and user-defined fields.

MAKING CONT-ACT!

Entering new contacts in your database is easy, thanks to a logical field layout and three options for duplicating fields in new records. Each contact's history log contains time-stamped records of all interactions, be they phone calls, correspondence, or tasks. Modifiable pick lists save time when you're documenting contact results and scheduling follow-ups.

ACT! devotes the entire Lookup menu to search options. You can track

Workgroup Contact Managers

down individuals or related groups of individuals by selecting from almost a dozen indexed fields or by doing a general search through the entire database. Completed search results can be saved as a group. You can also manually build your own groups of contacts that don't share a common field but have an undocumented shared characteristic. These custom groups are new to Version 2.0.

You can duplicate contact databases over the network by copying .DBF files, but you can't coordinate remote databases over a LAN or a WAN. Laptop users carrying portions of the contact database can update their records with ACT! Mobile Link, an add-on priced at \$299 for three users. The add-on allows two-way data exchange between remote users and a central database via e-mail or a LAN dial-up connection. (Mobile Link includes a mail system for those who lack one.)

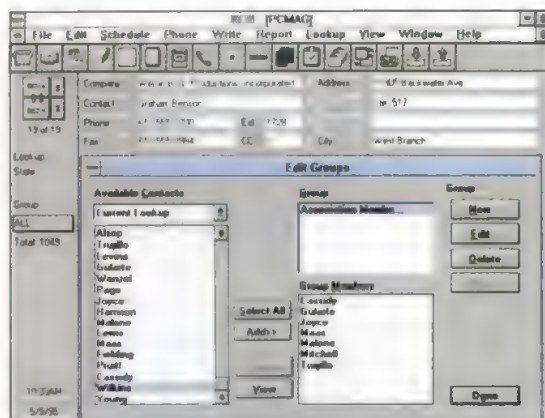
Mobile Link is designed for fast and easy exchanges; only changed records are marked for transmission on both ends, and exchanges are done on the field level, with the most recent change taking precedence on the server. In addition, records on the central database can be designated

as read-only; in other words, the remote user can view but not change records. And a remote user's private records can be withheld from merges. Mobile Link doesn't address the issue of distributed databases across the enterprise, but it effectively maintains data integrity for remote users.

PLANNING EVENTS

When it comes to scheduling appointments, phone calls, and other events, ACT! doesn't miss a beat. Pop-up calendars and pick lists speed data entry. If you don't have the desired contact's record open, select it from the pop-up contact list without changing the current view. Alarms and generous recurring-event options keep you on track; events can be rescheduled using drag-and-drop. You can see several views of your calendar, including a list view that outlines pending obligations. To-do lists can be maintained with similar ease and level of detail.

ACT!'s group scheduling, on the other hand, leaves something to be desired. You



ACT! lets you bypass its standard Search feature and assemble related individuals into ad hoc groups.

can schedule a meeting with another individual, but not a group. Nor, for the most part, can you tie activities to a group. You can, however, see other users' schedules, and use Version 2.0's new e-mail capabilities for notification. And to be fair, ACT!'s networking capabilities have improved since the last version. LAN features include file sharing with record locking and password protection and privacy options for activities.

Symantec has added new functionality

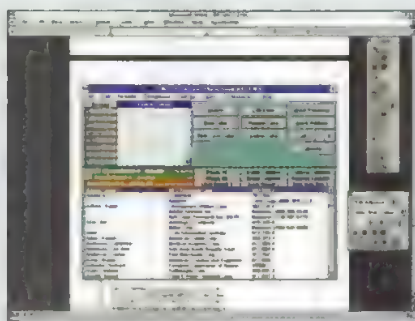
Info Accelerator 3.0: Blending with Your Word Processor

By Nelson King

Info Accelerator 3.0 (from Baseline Data Systems, \$99.95; \$119.95 for a server license) arrived too late for a full review but warrants comparison with other products in this roundup.

At first glance, Info Accelerator seems specially designed for businesses that emphasize word processing. But don't assume that's all there is to this product; the general contact-management capability runs surprisingly deep. Info Accelerator supports all the standard contact-management features: phone book, scheduler, calendar, phone dialing, correspondence management, and activity logs.

As you might expect, the links between the phone book and word processing are exceptional. You can choose letters, labels, envelopes, forms, faxes, and mail-merge—right off your Ami Pro, Word for Windows,



Info Accelerator runs from the menu of major Windows word processors.

or WordPerfect menu.

The range of features in the phone book is unusually wide: You can search on all fields (including notes), user-definable contact categories and quick phrases. Of special note is the way Info Accelerator handles groups of contacts. Not only can you create and save queries that extract sublists of

contacts, but the program stores the results of up to three queries.

Info Accelerator's calendar and scheduling features, though not as slick as some, pack a wealth of details: daily, weekly, monthly and yearly views; recurring events; alarms; and the ability to selectively display types of events like calls only.

Info Accelerator uses the Paradox engine to provide robust multiuser data management, but the network setup seemed unusually complicated because of choppy documentation. The program doesn't support group scheduling or e-mail connections.

Info Accelerator clearly departs from the standard contact-manager model, and not everyone will love it. Yet outside of weaknesses in workgroup capability and reporting, it covers all the contact-management bases, some of them exceptionally well. □

Workgroup Contact Managers

to ACT! 2.0 for Windows, without compromising any of its usability; it remains, as it always has been, a superb contact manager. Because of its deficits in workgroup operations, we can't enthusiastically recommend it for those who need a robust LAN installation. But for single-user contact management, it's hard to find a better blend of function and usability.

multiuser support on a single database and doesn't require much expertise to configure, it does require you to go through a database setup before you can use the program. Most competing packages provide easier ways (tutorials, sample databases) for you to get acquainted with the program before going on to configuration details. A lack of polish is evident in the Quick Start Guide where network installation directions often end with "Please see the instructions in your DOS manual."

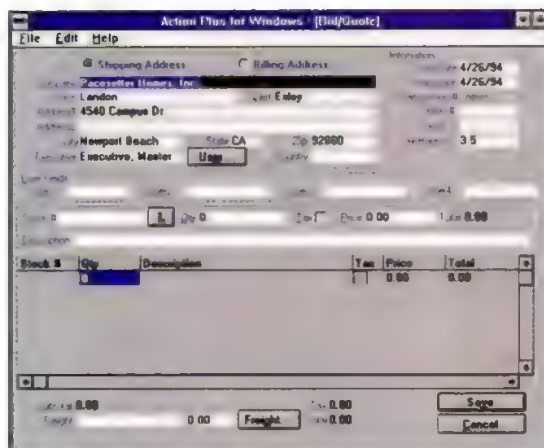
BATTERY INCLUDED

To display contact and sales information, Action Plus switches you among a battery of windows for profiles (contacts), notes, a schedule, a to-do list, sales accounting, and a history log. This implementation sacrifices some flexibility, because most windows are modal, meaning you can't edit in two windows at once.

Using the Profile window to display contact information, Action Plus easily covers the basics. But if you need more, you can create an unlimited number of Data Windows (user-defined screens) with up to 70 additional items each. The Profile Window is also the access point to sales accounting, which allows contact information to be automatically transferred into the sales system. Again, this immediate ability to create a bid (or quote), enter an order, or create a sales forecast is Action Plus's main selling point.

The approach is well-suited for contact management that emphasizes actual sales over prospecting or marketing. Because this type of sales activity is typically implemented with a telemarketing strategy, blending phone calls with order entry, you would expect Action Plus to support tight integration with phone dialing. Surprisingly, Action Plus does not in fact support telemarketing.

The program's basic phone-related features are good: You can dial out or receive an incoming call (with or without a timer), and when the call is done, you're automatically prompted to enter a result. When complete, the call is entered in the history log by date and time. Action Plus doesn't, however, let you set a sequence of actions



The ability to enter Sales Quotes/Bids from the contact screen is a major and unique feature of Action Plus.

based on the results of a call. Nor is there a direct link between entering call results and the sales accounting features.

For scheduling and task (to-do) management, Action Plus has the standard features. There are good-looking calendar views for day, week, month, and year. You can enter tasks and appointments for either contacts or yourself, set alarms for events, create recurring events, and assign appointments to other "account executives" (individual users). This last feature doesn't extend far, however, because of the lack of group-scheduling capabilities.

Other forms of collaborative contact

FACT FILE

ACT! 2.0 for Windows

List price: \$199; 5 users, \$599; Mobile Link, 3 users, \$299 **Requires:** 4MB RAM, 5MB hard disk space **In short:** ACT! for Windows is one of the best contact managers around. It offers thorough scheduling and task lists, detailed record structures for contact databases, internal mail-merges, and automated history logging. Even novices should be up and running quickly, thanks to ACT!'s clear, intuitive interface. Weak workgroup capabilities keep it from heading the list in this roundup.

Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014, 800-441-7234, 408-253-9600; fax, 408-252-4694

\$24 on reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Excellent	Excellent
Personal scheduling	Good	Excellent
Correspondence	Excellent	Excellent
Workgroup	Fair	Good
Remote	Fair	Fair

Mobile Link

	Power	Ease
Workgroup	Good	Good
Remote	Good	Good

Action Plus Software Inc.

Action Plus for Windows 1.51

BY NELSON KING

If you need to go quickly from handling sales prospects to taking orders, you probably also need fast access to your contact-management data and an easy link to your sales accounting information. In that case, you should consider Action Plus for Windows 1.51 (\$395; additional user, \$195), a product that links the two. Unfortunately, in other respects—particularly in workgroup capabilities—Action Plus offers a thin outline of features and hasn't achieved the level of completeness necessary to compete with the front runners in sales-oriented contact management.

Although Action Plus provides basic

FACT FILE

Action Plus for Windows 1.51

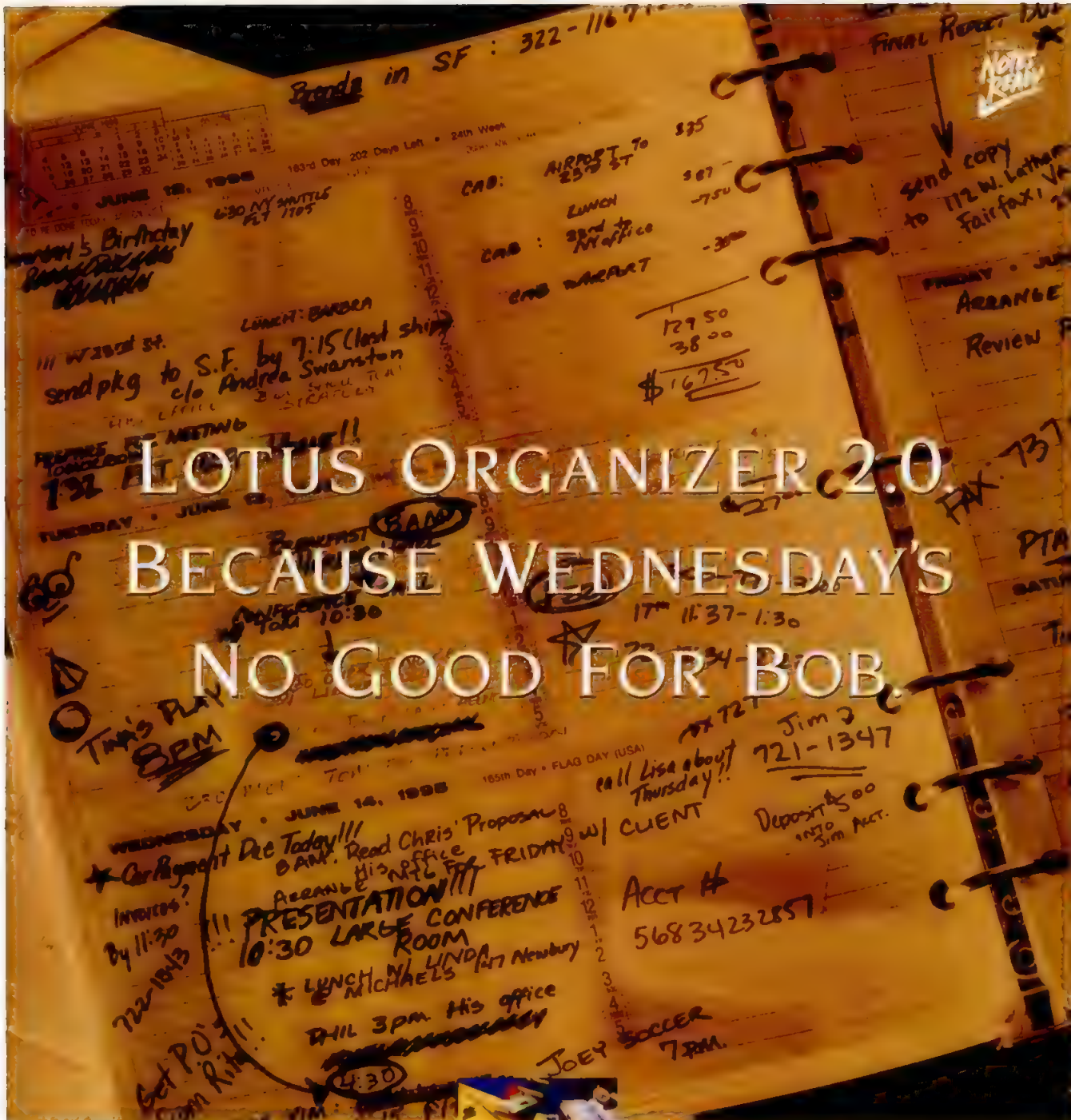
List price: \$395; each additional user, \$195. **Requires:** 4MB RAM, 7MB hard disk space. **In short:** By adding bid/quote development, order entry, and sales forecasting to standard contact management, Action Plus has staked out its territory among similarly sales-oriented programs. It also provides flexible support for contact and sales data. But Action Plus comes up short in most workgroup features and shows a lack of polish even in general contact-management operations.

Action Plus Software Inc., 112 W. Business Park Dr., Draper, UT 84020; 800-766-7229, 801-572-2555, fax, 801-572-2944

\$25 on reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Fair	Good
Personal scheduling	Good	Good
Correspondence	Good	Good
Workgroup	Poor	Poor
Remote	N/A	N/A



There's some kind of cosmic waffle rule that applies to business meetings: if you reschedule once, you will have to reschedule a dozen times. Because if it isn't Bob, it's Joan, or Gayle, or Jorge. And meanwhile, the perceived importance of any meeting is inversely proportional to the number of times it is pushed back. It's been proved.

And that's why there's the new Organizer™ 2.0 with group scheduling. Organizer makes setting up a meeting easy. You choose your attendees from a point and click list. You see their availability. Once you've selected a time and location and posted



your invitation. Organizer makes it easy for your invitees to accept, decline or send a delegate. Organizer works in conjunction with ccMail™ or Notes® for users in workgroups or across entire organizations.

Of course, Organizer is famous as a personal information manager—and now it goes a step further, adding group scheduling that's easy to install, use and support. Check out the new Organizer. For a free copy of our helpful booklet, *Managing Meeting Mania*, or for more information, call 1-800-872-3387, ext. A872.*



Organizer 2.0 with Group Scheduling.

Workgroup Contact Managers

management are also implemented unevenly. On the one hand, Action Plus has a built-in word processor and supports integration with the major Windows word processors, giving it a flexible mail-merge capacity. But it doesn't let you build macros to automate repetitive sequences of events. Action Plus has a healthy lineup of reports, created by a respected

third-party report generator (Relational Report Writer), but to create your own, you'll need to buy the report generator.

Outside of support for multiple users, this version of Action Plus has little to offer for workgroup contact management: no e-mail, limited use of contact groups, and no remote synchronization. The company is currently developing Version 2.0, which

should be available by the time you read this, and which promises to address some of these shortcomings. It also promises to enhance the sales accounting orientation by introducing invoicing and inventory tracking. Action Plus is a good choice if you can benefit from its sales accounting features, but if workgroup capabilities are what you need, it's well behind the leaders.

Networked PIMs: How Do They Stack Up?

There's always been a broad overlap between contact-management and personal information-management software. Each category is built around an electronic phone book and appointment calendar.

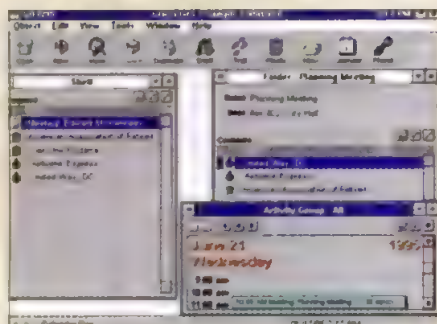
Frankly, many end users are confused as to what really differentiates PIMs and CMs, and that confusion also extends to the developer/publisher community.

Like the contact managers reviewed in this story, several PIMs—CrossTies for Workgroups, DayTimer Organizer, Ecco Professional, Lotus Organizer, and Relish—have been released as networked products, shifting their focus to group information management. In an attempt to clarify how well a PIM can handle the job of contact management, we evaluate these products. (Ecco, one of *PC Magazine's* Editors' Choice in our most recent PIM roundup, is covered in a separate sidebar.)

CROSSTIES FOR WORKGROUPS

By Barry Brenesal

CrossTies for Workgroups, from CrossTies Software Corp. (list price, \$299; 800-955-8437, 214-407-9996), is the most Mac-like of PC-based PIMs, clothing its database in an object-oriented environment. Everything in CrossTies is viewed and manipulated as an object. Default object icons are



CrossTies treats everything as objects to be linked and displayed as needed.

CrossTies for Workgroups remedies some of the problems associated with CrossTies 1.0. You can now schedule appointments by dragging contacts onto the calendar, and the product now supports recurring activities. Difficulties remain, however, most notably in the import/export function. CrossTies can import files from several information managers, but if you switch to an unfamiliar format, it doesn't have a field-matching utility.

CrossTies' networking features are slim. Security options are limited to individual passwords. There aren't any at-a-glance group calendars to analyze a team's activities, and there is no method of delegating employee tasks. Network installation is a hassle, with scanty documentation at this point.

included, but you can also create your own. Searching in CrossTies is more complex than in most contact managers. You can't search on a word, phrase, or address from the main menu. Instead, you must apply filters to a list of objects.

Aficionados of object-oriented interfaces will probably like CrossTies. But lack of strong networking and remote functionality makes it less than perfect for extensive workgroup use.

DAY-TIMER ORGANIZER

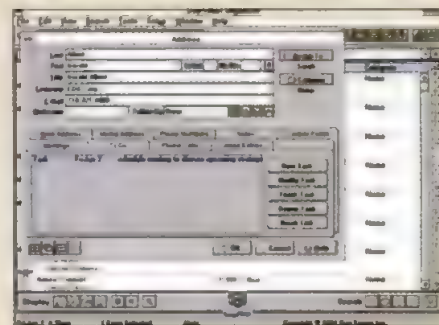
By Sarah Roberts

For accomplishing the workgroup basics, such as group scheduling and assigning tasks and projects to members of your team, Day-Timer Organizer, from Day-Timer Technologies (list price, \$139; 800-225-5005, 415-572-6280), is a solid choice. But this product's searching and sorting capabilities are still its strongest features. And if you're familiar with the paper version of Day-Timer Organizer, you'll probably feel comfortable using this product.

One of Day-Timer Organizer's strengths is ease of navigation: From the main screen, you can quickly access any of Day-Timer's 12 views. These are also easily accessed from the view menu command and the toolbar. Importing data works fairly well, and you're given plenty of import fields and a high level

of customizability.

Adding records is easy, and the record itself can be chock-full of information: You can put in notes or to-do lists, link the record to other entries, and more. And the program provides a wealth of sort options: by last name, organi-



The contact records in Day-Timer Organizer let you link to other records and more.

Workgroup Contact Managers

Jensen-Jones Inc.

Commence 3.0 Personal Information Manager

BY NELSON KING

Unlike most programs in this roundup, Commence 3.0 Personal Information Manager for Windows (\$295; three users, \$695; five users, \$1,125), from

Jensen-Jones, isn't structured for sales activity or contact management. In fact, this product doesn't have any explicit orientation; *you* provide it by customizing. This customization goes way beyond choosing colors or even defining data and screens. You can create databases, design desktops, set unique data relationships, orchestrate events, and integrate fax, e-mail,

phone calling, and word processing. An enormous amount of flexibility is offered, which may be a barrier for some users, but that's Commence: the protean PIM.

Installing the single-user version of Commence is uncomplicated. The Workgroup version of Commence (scheduled for summer release) wasn't available for this review, but you can expect it to offer

zation, ZIP code, or follow-up date. Day-Timer Organizer also has extensive search options, making it fast and easy to filter down to the information you need in the database.

Looking at the workgroup features in more detail, Day-Timer's group scheduling lets you check the availability of coworkers and resources; the find time feature ferrets out meeting times when all invitees can attend. This program also lets you assign or delegate tasks to members of your workgroup and track progress.

Day-Timer Organizer is an efficient PIM with the beginnings of true workgroup capabilities. But its real strength lies in its speed and precision for digging down into data.

LOTUS ORGANIZER 2.0

By Yvonne Koulouthros

Now in its second major revision, Lotus Organizer 2.0, from Lotus Development

Corp. (street price, \$99; 800-343-5414, 617-577-8500), has improved substantially since we last reviewed it.

Although a few areas could use still more polishing, Version 2.0 has gained depth in single-user features and has begun to address workgroup needs.

Organizer now makes personal calendars available to the workgroup and handles meeting scheduling directly and via Lotus Notes or cc:Mail.

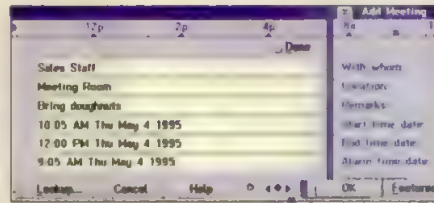
Considered strictly a PIM, there's much to like about Organizer. Its

friendly interface is based on an icon-oriented, customizable notebook divided with tabs into seven main sections.

Navigating is simple; just clicking the tabs, icons,

or ear-marked pages takes you where you want to go. Unfortunately, though, you can't view screens simultaneously.

Among the improvements to this version of Organizer are significantly expanded capacities. For example, the Address section was limited to only one address and two telephone numbers per contact. Now, Version 2.0 has 33 default fields per contact. And you can easily import ASCII and dBASE data files. Other notables features include the Planner, a colorful miniproject manager, and the Anniversary section, a handy annual-event tracker.



Relish's scheduling capabilities are strong, whether for an individual or a group.

5121), is a convenient tool for individual OS/2 users who spend lots of time on the phone. But as a group contact manager, Relish falls short. The contact database

provides only four data fields: phone number, contact name, address, and remarks. This less-is-more approach might do for personal phone work, but you wouldn't choose Relish for activities like telemarketing.

Another tradeoff: Relish's searches are quite speedy, even when working with wildcards. This speed, however, comes at the expense of structure within the database. For instance, a contact's address is one big, unformatted field, making correspondence and data import/export quite problematic.

We also looked at Relish's five-user configuration, Relish Net 2.2 (\$685). It has strong group-scheduling capabilities, allowing you to search for blocks of free time among user groups and schedule meetings based on the results, complete with automatic notification to all parties. As invitees accept meeting obligations, Relish automatically places the meeting on their calendars and sends an acknowledgment back to the originator.

Aside from this strength, however, Relish Net is plagued by the same basic problem as the single-user product: The contact database is simply too limited for anything beyond personal phone contacts.

While again, this isn't necessarily crippling in a PIM, Relish clearly does not have much workgroup potential. □



The Planner, Organizer's colorful miniproject manager, enhances single-user capabilities.

strides but has only scratched the surface of the workgroup realm.

RELISH 2.2

By Kevin Reichard

As a PIM, Relish 2.2, from Sundial Systems Corp. (list price, \$189; 310-596-

GET TWICE THE ADVANTAGE.

Introducing

PenDirect[®] 2000

ADVANCED LIGHT PEN INPUT
FOR WINDOWS[®] 95



Two-Button Design For Full Windows[®] 95 Compatibility.

Strain-free input with precise control and one-to-one cursor interaction.

Full two-button mouse functionality.

Annote MS-Word documents quickly and easily.

Works with any monitor.

ORDER PENDIRECT 2000
WITH ITS 30-DAY,
UNCONDITIONAL
MONEY-BACK GUARANTEE.

800 967 3997

**FTG DATA
SYSTEMS**

8381 Katella Avenue
Stanton, CA 90680
Tel: 714-995-3900
Fax: 714-995-3989

E-Mail: 74774.3142@compuserve.com

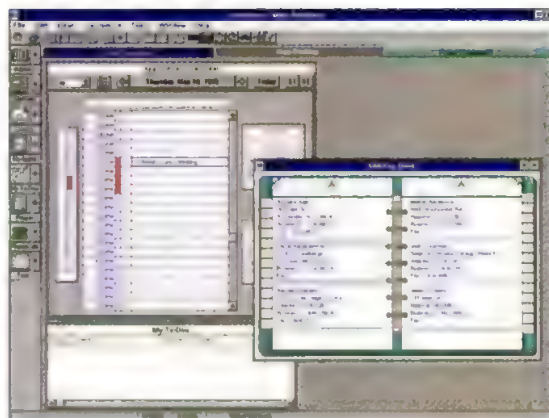
All trademarks property of their respective owners.

Reseller News

CIRCLE 200 ON READER SERVICE CARD

SOFTWARE

Workgroup Contact Managers



The ability to display and customize multiple views in multiple desktops helps make Commence extremely flexible.

full network support and enhanced data synchronization with two-way e-mail and remote server links.

Unfortunately, customizing Commence is hobbled by surprisingly inadequate documentation. Important how-to instructions are buried in the manual's "What's New" appendix, and agents, a powerful programming-type feature, get a scant three pages with no examples for many options. The weak documentation also affects setup for workgroup features like importing data, e-mail, and connections to other Windows programs.

THE FACE OF FLEXIBILITY

The basics of Commence's user interface illustrate some of the program's flexibility. The visual metaphor is a set of three *desktops* displayed as tabs on a file folder: Main, Contact Management, and Project Management. Bordering the desktops are the standard menu, toolbar, and Commence's *view bar*, which gives you instant access to eight standard *views* (windows displaying information from the underlying database): Address Book, Calendar, Letters, Appointments, To-Do, People, Phone Calls, and Tasks.

Commence provides five other views, and you can create any number of your own, save them by name, and even put them on the view bar. You can also create your own desktops, each configured to contain any combination of views.

Views can do much more: They can be filtered or printed, and you can establish a *view link* (for example, scrolling in the Company view immediately displays the associ-

ated people in the People view). Of course, views can be customized. You can even define multiple views for the same category of data, such as contacts having both a business and a personal view.

Within views, Commence is big on creating links between items, called *connections*. Using a connection pop-up field, you can link a contact with a meeting or other predefined connection types (or create your own). You can develop a web of connections to model almost any type of business relationship,

such as linking a company with its public relations firm, media lawyer, and vice president of marketing for a sales campaign.

Commence's calendar view is better than average, partly because it does quick entry by recognizing common words and converting them into data. Commence supports group scheduling and can share to-do items among coworkers. Taking this even further, scheduled to-do items can be dragged and dropped into Commence's task management, which uses the Project Management view, a Gantt chart displaying distribution of tasks over time.

The showcase feature of Commence's

► FACT FILE

Commence 3.0 Personal Information Manager

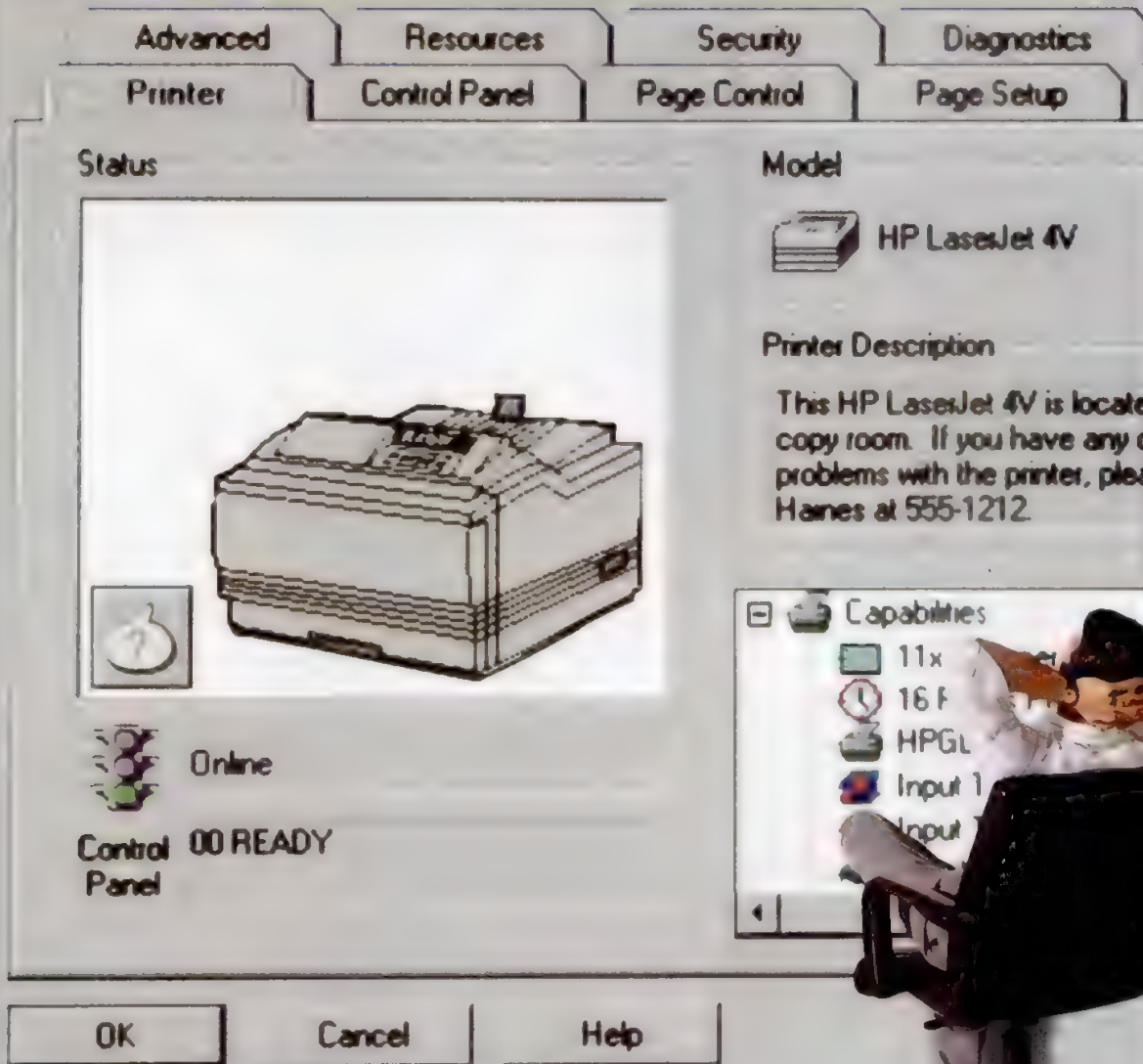
List price: \$295, 3 users, \$695 **Requires:** 4MB RAM, 6MB hard disk space (10MB for Workgroup) **In short:** The Windows version of Commence is loaded with features and can be customized into almost any kind of information manager, including a top-of-the-line contact manager. But this customization requires sufficient effort and expertise. Otherwise, you'll find yourself needing a Commence professional, rather than doing it yourself.

Jensen-Jones Inc., 328 Newman Springs Rd., Red Bank, NJ 07701; 800-688-7080, 908-530-4666, fax, 908-530-9827

526 in reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Excellent	Good
Personal scheduling	Excellent	Good
Correspondence	Good	Good
Workgroup	Fair	Good
Remote	Good	Fair



HP's new JetAdmin software for Windows 95. It's like cruise control for your network printers.

Running network printers doesn't have to take a lot of running around. Fully integrated into Microsoft® Windows 95, HP JetAdmin printer management software offers unprecedented ease of use for both you and your users. You'll appreciate quick and simple network printer installation, sophisticated pre-emptive diagnostics, and remote troubleshooting tools. Users will appreciate simple, point-and-click

printing, along with real-time printer status and job tracking. Features that, together, mean less work for you.

JetAdmin software is also available for IBM OS/2 LAN Server, Novell NetWare, Windows™ 3.1 and UNIX®.* From time-saving software to networkable LaserJet and DeskJet printers, HP has an intelligently simple network printing solution ready for you now.

Call 1-800-LASERJET, Ext. 9317 for more information and a free demo CD.*

HP Network Printers
Just what you had in mind.



Workgroup Contact Managers

task management is called an *agent*, the product's term for the ability to perform a sequence of actions based on conditional logic for a specific event. For example, an agent can respond to an incoming e-mail message and, depending on the type of message, trigger a printed report and display a particular view.

Using features such as connections and agents, Commence combines an extremely full roster of contact management capability with an extraordinary degree of flexibility. This cuts two ways: Commence has lots of power, but it's a program you need to wear a while before knowing how to make it fit. Watch for Commence Workgroup around the end of June: It could put Commence up there with the best of the workgroup contact-management category.

Elan Software Corp.

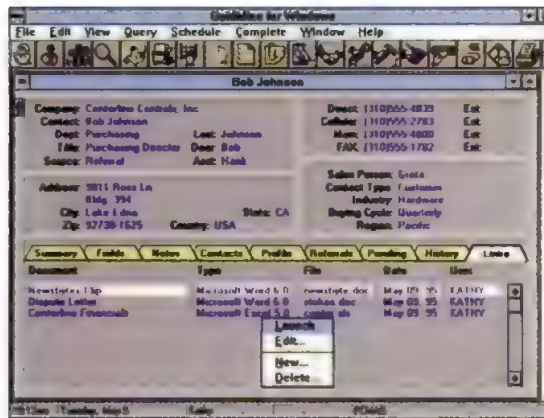
GoldMine for Windows 2.5a

BY KATHY YAKAL



Elan Software Corp.'s GoldMine for DOS received an Editors' Choice award in *PC Magazine's* latest contact-management roundup (August 1993). Not long afterwards, GoldMine for Windows 2.5a (\$295; five users, \$895) was released, and it is equally worthy of top honors. The scheduling and database-management features are combined with sophisticated sales-oriented functions and analysis tools as well as a high level of customizability, all of which make it hard to beat. GoldMine for Windows would appeal more to less technical users if some of its language and processes were simplified, but it's clearly one of the most flexible, full-featured contact managers around.

Although some contact managers are built for single users but can run on a network, GoldMine was developed for workgroups. Network installation works flawlessly on both file server-based and peer-to-peer systems, as long as the installer is reasonably proficient with LANs. Because GoldMine's workgroup capabilities are so extensive (for example, it has scheduling, e-mail, and shared databases with privacy options), the configuration tools provided are designed more for the advanced system administrator



GoldMine organizes critical data, such as referrals and contact history, into file folders.

than the average user.

GoldMine's screens are surprisingly clean, considering the depth of information they hold. Contact records are laid out across the top of the display; a series of file-folder tabs runs along the bottom. As you view each contact, you can click on tabs to toggle between folders—an effective way to store and view a large amount of information. Local menus are used extensively here and throughout the program, as are aids like pick lists and well-placed, recognizable icons and buttons.

BRINGING IT IN

If you have large databases stored in another major contact manager, you can use GoldMine's prefab templates to import them; you can also bring in ASCII or .DBF files. The import program would be less intimidating to novices if it were better documented, but once mappings were defined, our test files imported cleanly.

When you enter a new contact record in GoldMine, you can select among four starting points: a blank full record, a partial record, a duplicate record (copy minus the company and contact name and the phone number), and a template record (with user-defined fields, like the state of California, already filled in). GoldMine's phone dialer and timer speed up and quantify phone sessions, so you can track billable time. An entire menu is devoted to completing activities, like phone calls and appointments, and all completed tasks migrate automatically to the history log.

GoldMine really shines when it comes to searches. You can quickly search for records using any of the preindexed fields

(like Company, First Name, or ZIP Code) or one of the five user-defined Key fields. The Search option lets you comb through nonindexed fields (or every field) but this is considerably slower. Using the Goto command, you can jump to the last-viewed, next, or previous record, or to a specific record number.

Each contact can be assigned to numerous Profiles, user-defined categories that group contacts by one or more related characteristics, like type of computer owned. You can run indexed searches on Profiles. You can also use filters and groups to pull out subsets of data.

UPDATING DATA

Whether your coworkers are in the next room or the next state, you can synchronize data remotely so all your GoldMine databases match. Synchronization sessions exchange only data that has changed since the last synchronization—this data is called a transfer set. This data can be sent via e-mail or dispensed manually

FACT FILE

GoldMine for Windows 2.5a

List price: \$295; 5 users, \$895; GoldSync, 3 users, \$495. **Requires:** 4MB RAM, 6MB hard disk space. **In short:** GoldMine was designed to function effectively in workgroups, and it does. It offers an impressive mix of standard contact-management features and excels in areas like search options and sales analysis. A consistent, understandable interface simplifies recording and retrieving data.

Elan Software Corp., 17383 Sunset Blvd, Pacific Palisades, CA 90272, 800-654-3526, 310-454-6800, fax, 310-454-4848

527 on reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Excellent	Excellent
Personal scheduling	Excellent	Good
Correspondence	Excellent	Good
Workgroup	Excellent	Excellent
Remote	Excellent	Good

GoldSync

	Power	Ease
Workgroup	Excellent	Excellent
Remote	Excellent	Excellent

COREL CD OFFICE Companion™

The best CD to complete your office suite

Internet Web Browser and Fax

Corel Web Mosaic™

- Built-in playback support for AIFF and AU audio files
- Direct display of GIF and JPEG images
- Full printing applications

CorelFAX™

- Send faxes from within any Windows application
- Built-in OCR and TWAIN-compliant scanning
- Send and receive faxes in the background

Personal Information Manager

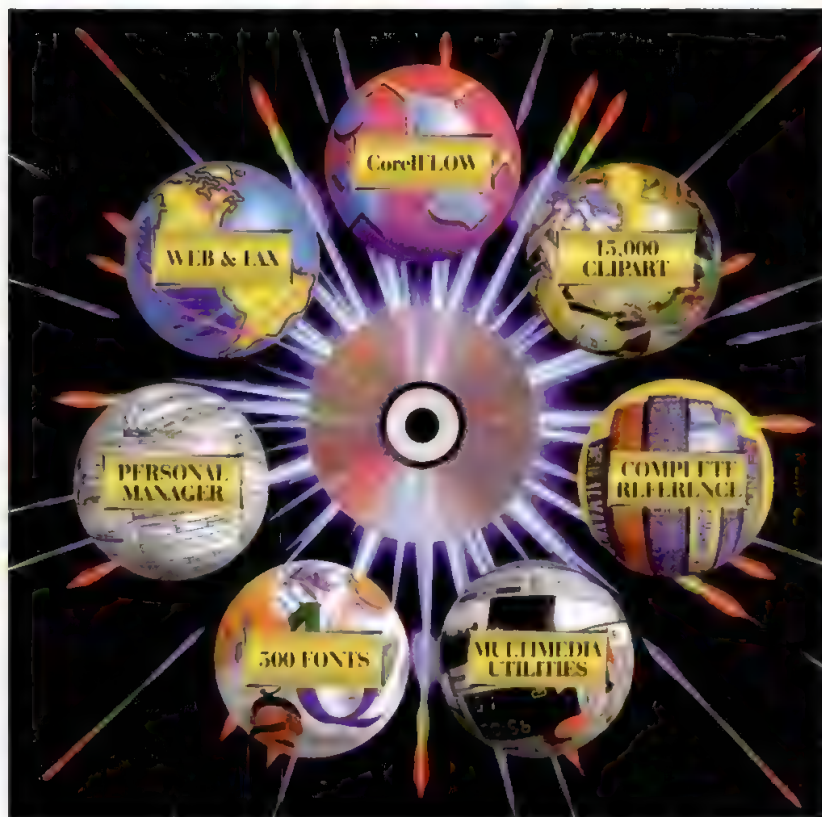
Corel PLANNER™

- Cross-reference information easily by linking related items together
- Daily, weekly, monthly and yearly calendar views for planning appointments and activities

Fonts

Corel FONT MASTER™

- 500 high-quality Bitstream® and URW™ fonts
- Preview fonts, assemble font groups, install and de-install TrueType® fonts on the fly



Business Graphics

CorelFLOW™ 2™

- 2,000 "drag and drop" symbols
- 90 customizable Smart Symbol Libraries
- Built-in spell checker
- Automatic shape connectors

Clipart and Photos

Corel GALLERY™ 2™

- 15,000 clipart images
- 200 photos and 75 sound clips
- Full-color reference guide with thumbnails of each clipart image

Complete Electronic Reference

Corel BOOKCASE™

- 6 comprehensive references
- **Correspondence Library**—700 standard business letters

Multimedia Utilities

- **Corel CD Audio™**—Listen to your favorite audio CD from your CD-ROM drive
- **WinTune™ 2.0**—System diagnostic indicator to optimize the performance of your PC
- **WinDat™ .WAV Editor**—Record and edit sound clips
- **Corel Screen Saver and Wallpaper Flipper**

You've got your office suite... but to maximize your productivity you need Corel CD Office Companion. It's value-packed with World Wide Web and fax communications, business graphics, PIM, clipart, fonts, reference libraries and multimedia utilities—all on one convenient CD-ROM!

Corel CD Office Companion—the ideal complement to:

- Microsoft® Office
- Novell® PerfectOffice™
- Lotus SmartSuite®



*Clipart, font and photo libraries vary from the standalone versions of CorelFLOW 2 and Corel GALLERY 2.

Microsoft is a registered trademark of Microsoft Corporation. PerfectOffice is a trademark of Novell, Inc., and SmartSuite is a registered trademark of Lotus Development Corporation. Microsoft Corporation, Novell, Inc. and Lotus Development Corporation make no endorsement of Corel or Corel CD Office Companion.



COMPUTER DISCOUNT WAREHOUSE
800-874-3CDW

\$91⁹⁹

US\$ plus applicable taxes.



Call now for faxed literature!
1-613-728-0826 ext. 3080
Document #1058

CIRCLE 073 ON READER SERVICE CARD

Workgroup Contact Managers



YES	Ace for Windows 3.0	ACT! 2.0 for Windows	Action Plus for Windows 1.51	Personal Information Manager	Ecco Professional 2.0	GoldMine for Windows 2.5a	Janna Contact 2.0
Products listed in alphabetical order							
List price (single user except as indicated)	\$49.95	\$199.00 (4 users, \$599.00); Mobile Link (3 users), \$299.00*	\$395.00 (\$195.00 per each additional user)	\$295.00 (3 users, \$695.00)	\$279.00 (10 users, \$1,550.00)	\$295.00 (5 users, \$895.00); GoldSync (3 users), \$495.00*	\$99.00
Calendar/Scheduling							
Adjustable workday/workweek							
Adjustable schedule increments							
Event alarm							
Daily/weekly/monthly/yearly appointment view							
Schedules recurring appointments							
Daily/weekly/biweekly/monthly							
Weekday within the month ("the third Friday")							
Finds free time							
Displays free and busy time graphically							
Conflict alert/resolution							
Searches appointment text							
Tasks/Todo-Do							
User can assign tasks to others							
User can assign categories to tasks							
User can attach notes to task entries							
User can retain history of tasks after completion							
User can schedule recurring tasks							
Daily/weekly/biweekly/monthly			N/A				
Weekday within the month ("the third Friday")			N/A				
Address Book/Rolodex							
Maximum number of databases	Unlimited	Unlimited	1	1,000	Unlimited		Unlimited
Default database-file format	FoxPro	.DBF	DBF	Proprietary	Proprietary	.DBF	.DBF, .MDB
Can import directly from other PIMs or contact managers							
Imports and exports ASCII files (delimited)							
Imports and exports ASCII files (fixed-length)							
Can reconcile or flag duplicate entries							
Number of phone fields in a standard record	8	4	3	99	5	4	Unlimited
Maximum number of user-definable fields	59	70	Unlimited	99	Unlimited	1,000	Unlimited
Maximum number of alternative contacts per record	1	2	Unlimited	32,000	None	Unlimited	None
Default fields included for:							
Beeper number				(user-definable)			
Customer ID number				(user-definable)			
E-mail carrier				(user-definable)			(user-definable)
Reference							
User can assign categories to entries							
Maximum number of categories	Unlimited	Unlimited	Unlimited	300	Unlimited	Unlimited	Unlimited
Searches							
By first letter							
By last name							
By organization							
By ZIP code							
By area code							
By keyword							
Searches multiple fields							
Boolean searches							
User can save queries							
User-definable contact groups							
List view available							
User can attach notes and text to contact record							

N/A—Not applicable. The product does not have this feature.

1 Remote database-synchronization features are supported via the add-on Mobile Link 2 Remote database-synchronization features are supported via the add-on GoldSync

over the network. Elan Software's ambitious add-on, GoldSync (three users, \$495), automates this process, allowing data synchronizations to be performed spontaneously via dial-up or at scheduled intervals.

With GoldSync, both contact records and schedule information can be synchronized—as opposed to the basic GoldMine package, which allows synching of records only. Both types of retrieval can be specified, down to the field or record type. For example, you can request only new callback tasks from the server. This level of synchronization is not found elsewhere in the contact-management world.

GoldMine offers the scheduling prowess of the best information managers for standalone users. Simple menus, clear dialog boxes, and use of tools like drag-and-drop rescheduling and polling for available time facilitate easy calendar management. But its workgroup-scheduling features surpass most. GoldMine integrates with Microsoft Schedule + and lets users see others' schedules, sending notes about meetings and tasks to each other via GoldMine's built-in e-mail system or MS Mail.

Other functions set GoldMine apart as well. It contains a framework for building, modifying, and using telemarketing scripts. Its sales analysis tools and healthy set of reports provide valuable management information. And the Automated Processes function lets you automate regularly scheduled events that might be forgotten during a sales cycle.

A program as highly evolved as Gold-Mine would benefit from more thorough documentation and on-line help and from simpler language in some processes to please both novice and experienced users. Even so, its fine combination of in-depth contact-management tools and outstanding workgroup capabilities earn high honors.

Janna Systems Inc.

Janna Contact 2.0

BY NELSON KING

Many products in this roundup tend to specialize, typically with a sales orientation. But Janna Contact, Version 2.0, from Janna Systems, has gone in the other direction by attempting

SUMMARY OF FEATURES

Workgroup Contact Managers



■ YES ■ NO

Products listed in alphabetical order

	Ace for Windows 3.0	ACT! 2.0 for Windows	Action Plus for Windows 1.51	Commence 3.0 Personal Information Manager	Ecco Professional 2.0	GoldMine for Windows 2.5a	Janna Contact 2.0
Call Automation							
Phone dialer	■	■	■	■	■	■	■
Automatic redial	■	■	■	■	■	■	■
Global-dialing prefix adjustment	■	■	■	■	■	■	■
Maximum prefix/suffix length	40, 40	28, 30	254, 254	Unlimited	Unlimited	14, 14	30, 30
Local-area-code adjustment	■	■	■	■	■	■	■
Logs phone calls automatically	■	■	■	■	■	■	■
Logs call duration	■	■	■	■	■	■	■
User can attach notes to phone log	■	■	■	■	■	■	■
Call reminder and alarm	■	■	■	■	■	■	■
History							
Time/date stamps phone calls	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Last action taken recorded for all fields	■	■	■	■	■	■	■
In free-form text file	N/A	■	N/A	■	N/A	■	N/A
In log file	N/A	■	N/A	■	N/A	■	N/A
Automatic follow-up reminder	■	■	No	■	■	■	■
User can purge historical records by date range	■	■	No	■	■	■	■
Free-Form Information							
Memo or notes entries	■	■	■	■	■	■	■
User can search notes entries	■	■	■	■	■	■	■
User can index selected keywords	■	■	■	■	■	■	■
User can index all words	■	■	■	■	■	■	■
User can assign categories to notes	■	■	■	■	■	■	■
User can organize information in folders	■	■	■	■	■	■	■
User can organize information in outlines	■	■	■	■	■	■	■
User can create links or associations between items	■	■	■	■	■	■	■
User can link externals like documents and files	■	■	■	■	■	■	■
Workgroup Features							
Private and protected entries	■	■	■	■	■	■	■
Shared individual calendars	■	■	■	■	■	■	■
Can show schedule details	N/A	■	■	■	■	■	■
Isolates free time	N/A	■	■	■	■	■	■
User can grant variable rights to detail info	N/A	■	■	■	■	■	■
Allows private appointments	N/A	■	■	■	■	■	■
Finds group meeting times	■	■	■	■	■	■	■
Sends meeting requests	■	■	■	■	■	■	■
Remote Database Synchronization							
Bidirectional	■	■ ¹	■	■	■	■ ²	■
Changes at record/field level	■ ■	■ ¹ ■ ¹	■ ■	■ ■	■ ■	■ ² ■ ²	■ ■
Direct cable link	■	■ ¹	■	■	■	■ ²	■
Modem link	■	■	■	■	■	■ ²	■
Remote server link	■	■ ¹	■	■	■	■ ²	■
Synchronizes contact, calendar, and task data	■	■ ¹	■	■	■	■ ²	■
Synchronizes schedule and calendar	■	■	■	■	■	■ ²	■
Full database replication	■	■ ¹	■	■	■	■ ²	■
Personal data synchronization only	■	■ ¹	■	■	■	■ ²	■
Password protection	■	■ ¹	■	■	■	■ ²	■
Transfer encryption	■	■ ¹	■	■	■	■ ²	■
Call-back feature	■	■ ¹	■	■	■	■ ²	■
Built-in e-mail	■	■ ¹	■	■	■	■ ²	■
Links to company's LAN-based e-mail system	■	■ ¹	■	■	■	■ ²	■
Links to public/dial-up e-mail system	■ ■	■ ¹ ■ ¹	■ ■	■ ■	■ ■	■ ■	■ ■
E-mail messaging is automatically forwarded	■	■ ¹	■	■	■	■ ²	■
Supports OLE as client/server	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Allows ODBC access to data	■	■	■	■	■	■	■

N/A—Not applicable. The product does not have this feature.

¹ Remote database-synchronization features are supported via the add-on Mobile Link. ² Remote database-synchronization features are supported via the add-on GoldSync.

**IF PATIENCE
IS A VIRTUE, THEN
WE MUST BE
GOING TO HELL.**



At Xircom, heaven help us, we've just created the fastest CreditCard Ethernet adapter ever made.

As the inaugural member of our new Performance Series, this speed demon appeals directly to the devious part of your mind that says waiting is for those behind you.

We must confess, this card has tested a blistering 60% faster than its closest "competitor" (for want of a better word), and up to 120% faster than other cards, in some environments.

All thanks to our advanced, Look-Ahead Pipelining and unique full duplex capability. Which increases the raw data rate of the network. More importantly however, this

Check out the facts. You will surely find that what comes standard from Xircom makes our new, faster LAN adapters anything but standard.

CHECKLIST	Xircom	Others
Full Duplex Support	YES	NO
Advanced Power Management	YES	NO
Suspend/Resume Support	YES	NO
OS: Windows, OS/2, NT & Unix Support	YES	?
Network Operating System Support	6	?
Network Troubleshooting	70+	?

allows you to send and receive messages at the same time.

All this amounts to one thing: Pure speed. Pure, unprecedented, pressed-back-in-your-office-chair kind of speed which not only makes your applications scream, but your colleagues whisper.

But the temptations don't end there. Xircom also offers you a new Performance Series Token-Ring CreditCard. And every Performance

For a complete copy of our third-party test results, just call us at 1-800-775-0400 and request document #7001. Or if you'd like to receive our performance white paper, simply request document #7002

Series product is guaranteed to be compatible with every make and type of notebook. Additionally, they come with the widest range of NOS support available. Along with unmatched ease of use — as an example, our new Windows-based installation program gets you up and running in under one minute.

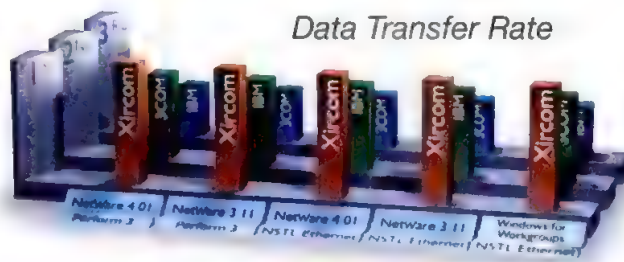
With all this, it's no wonder that Xircom has connected over two times as many notebooks to LANs

as all other LAN adapter vendors combined. In fact, there are already over a million satisfied Xircom LAN adapter users throughout the world.

Our rigid quality control along with our comprehensive spectrum of tests ensure that every Xircom LAN adapter will stand up to the

heat of the real world. Which is why we are able to back all of our products with a lifetime warranty.

At least for this lifetime.



What's more, every Xircom LAN adapter is backed by superior technical support. And a lifetime upgrade policy that lets impatient users get the latest technology at a substantial discount. We even offer 24-hour BBS and online CompuServe support.



So, if you are tired of waiting on your slower LAN adapter, visit or call your Xircom dealer or VAR.

Or you can call Xircom directly at 1-800-438-4526, Ext. 35B. We'll send you more detailed information about our new, impressively fast Performance Series CreditCard.

And then you can connect to your LAN with the one CreditCard that will never try your patience.

Xircom

The Mobile Networking Experts.

SUMMARY OF FEATURES

Workgroup Contact Managers

	Ace for Windows 3.0	ACT! 2.0 for Windows	Action Plus for Windows 1.51	Commence 3.0 Personal Information Manager	Ecco Professional 2.0	GoldMine for Windows 2.5a	Janna Contact 2.0
Word Processing Links to external word processor Integrated text editor/spell-checker Allows merged letters/faxes Imports boilerplate text Prints envelopes/labels Links to external fax software Internal fax capability							
Reports and Utilities Number of predefined reports Prints personal calendar Backup and restore facility Expense tracker Macro facility							
	17	9	25	26	0	62	11

N/A—Not applicable. The product does not have this feature.

1 Remote database-synchronization features are supported via the add-on Mobile Link. 2 Remote database-synchronization features are supported via the add-on GoldSync.

become available to the entire workgroup. Documents may have long descriptions and can be stored in folders for easy organization. For example, to send a boilerplate letter, you can drag a document's icon from Document Manager, drop it into a contact's Information Log, and from there, launch Word for Windows to edit it. The feature's potential for managing documents for entire projects—or for your entire business—are far-reaching.

Janna Contact has worked hard to make data entry and maintenance as easy as possible. All programs do, of course, so it's significant that Janna Contact's approaches—such as pop-up selection lists for most fields (excepting first and last names) and automatic address copy-

ing—work better than most. Alas, some areas where you shouldn't need manual entry, such as time-stamping calls in your phone log, don't seem to have received the same attention to ease of use.

The Schedule/Calendar has some uneven features as well. For example, scheduling recurrent activities is well implemented, but the ability to organize a sequence of "follow-up" tasks is limited. Such unevenness doesn't detract from the solid design of the Calendar and Scheduling capabilities; it just underscores the relative youth of Janna Contact and the need for further refinement.

Janna Contact does get good performance from its database engine, squeezing out a remarkable level of flexibility. You can create an unlimited number of custom data fields—in the main contact screen, at any time—in about four keystrokes. Custom fields can be created for individual contacts or assigned as default fields for all contacts. Most other programs require you to go to a special module to define fields (and often whole screens) in a highly structured fashion. Janna Contact's approach is just as effective and far less cumbersome.

Janna Contact needs to gain a bit more muscle before it becomes a true contender as a

workgroup contact manager: better custom-report capabilities, for example, or the ability to create and save groups of contacts. Its remote capabilities are limited, although a communication server and Janna Remote (for dialing into a Janna contact database) should be available by the time you read this. But at \$99, this package is an excellent value for those wanting to try a relatively full-featured workgroup contact manager; for small and medium-size organizations committed to the Microsoft Office environment, it's a terrific buy.

▶ FACT FILE

Janna Contact, Version 2.0

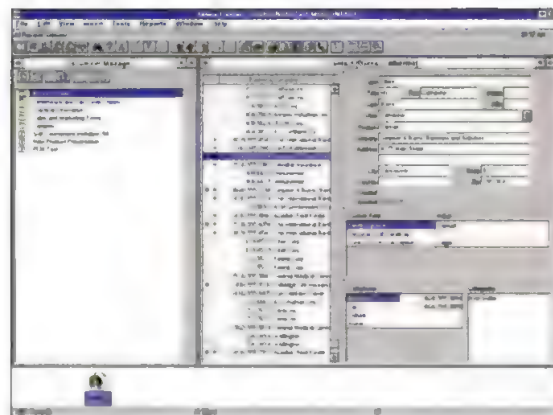
List price: \$99 **Requires:** 8MB RAM, 6MB hard disk space (10MB maximum) **In short:** Janna Contact, a somewhat nontraditional combination of workgroup contact and document manager, offers the ability to organize information from a wide variety of Windows applications. Janna Contact's ambitious approach nearly succeeds, and at \$99, it's an absolute bargain.

Janna Systems Inc., 3080 Yonge St., #6060, Toronto, Ontario, Canada M4N 3N1, 800-268-6107, 416-483-7711; fax, 416-483-3220

528 on reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Good	Good
Personal scheduling	Excellent	Good
Correspondence	Good	Excellent
Workgroup	Good	Good
Remote	Fair	Fair



Janna Contact has mastered the look and feel of Microsoft Office. This should help popularize it with Office users.

	Maximizer 3.0	SuperOffice 3.0	TeleMagic Enterprise for Windows 1.5	Tracker for Windows 2.0	WinSales 2.1
1	■	■	■	■	■
2	■ ■	■ ■	■ ■	■ ■	■ ■
3	■ ■	■ ■	■ ■	■ ■	■ ■
4	■	■	■	■	■
5	■ ■	■ ■	■ ■	■ ■	■ ■
6	■	■	■	■	■
7	■	■	■	■	■
8	■	■	■	■	■
9	■	■	■	■	■
10	■	■	■	■	■
11	■	■	■	■	■
12	■	■	■	■	■
13	■	■	■	■	■
14	■	■	■	■	■
15	■	■	■	■	■
16	■	■	■	■	■
17	■	■	■	■	■
18	■	■	■	■	■
19	■	■	■	■	■
20	■	■	■	■	■
21	■	■	■	■	■
22	■	■	■	■	■
23	■	■	■	■	■
24	■	■	■	■	■
25	■	■	■	■	■
26	■	■	■	■	■
27	■	■	■	■	■
28	■	■	■	■	■
29	■	■	■	■	■
30	■	■	■	■	■
31	■	■	■	■	■
32	■	■	■	■	■
33	■	■	■	■	■
34	■	■	■	■	■
35	■	■	■	■	■
36	■	■	■	■	■
37	■	■	■	■	■
38	■	■	■	■	■
39	■	■	■	■	■
40	■	■	■	■	■
41	■	■	■	■	■
42	■	■	■	■	■
43	■	■	■	■	■
44	■	■	■	■	■
45	■	■	■	■	■
46	■	■	■	■	■
47	■	■	■	■	■
48	■	■	■	■	■
49	■	■	■	■	■
50	■	■	■	■	■
51	■	■	■	■	■
52	■	■	■	■	■
53	■	■	■	■	■
54	■	■	■	■	■
55	■	■	■	■	■
56	■	■	■	■	■
57	■	■	■	■	■
58	■	■	■	■	■
59	■	■	■	■	■
60	■	■	■	■	■
61	■	■	■	■	■
62	■	■	■	■	■
63	■	■	■	■	■
64	■	■	■	■	■
65	■	■	■	■	■
66	■	■	■	■	■
67	■	■	■	■	■
68	■	■	■	■	■
69	■	■	■	■	■
70	■	■	■	■	■
71	■	■	■	■	■
72	■	■	■	■	■
73	■	■	■	■	■
74	■	■	■	■	■
75	■	■	■	■	■
76	■	■	■	■	■
77	■	■	■	■	■
78	■	■	■	■	■
79	■	■	■	■	■
80	■	■	■	■	■

Maximizer 3.0

Modotech Systems International's Maximizer solved a problem years ago that some contact-manager vendors still face: Users can attach unlimited contacts to one central organization or client—a list-based rather than a form-centric approach. This kind of flexibility appears throughout the program and is one reason Maximizer earned honorable mention in our latest contact-manager roundup. With few exceptions, Maximizer 3.0 contains the basics for effective contact management, offering enough detail and adaptability to please a wide range of users. But Maximizer's approach makes it less intuitive at the learning stage than some of its competitors, and though strong as a stand-alone contact manager, it can't match the top players in a workgroup setting.

Single-user setup is simple, and LAN administrators should have little or no trouble getting a workgroup going. Maximizer's main working menus are straightforward, divided into areas such as Actions, Tools, Search, and Views. Screen layout is less comfortable, though. You can have several windows open at a time: such as your client- or contact-list windows and corresponding windows that display notes, documents, and your Hotlist (pending tasks) for the current contact. Conventions like local, right-mouse-click-driven menus and drag-

and-drop are well implemented and speed up operations.

The very thing that makes Maximizer adaptable—its list-based approach—can also make it confusing. Modatech includes a built-in utility from Sea Ranch called MaxAction that overlays a form-based approach. This screen overlay displays one contact at a time in a box, along with button bars that perform Maximizer's most basic tasks, like adding appointments and notes and making phone calls.

Maximizer includes a simple data-mapping utility that facilitates importing ASCII or .DBF files. Its two-tiered database approach (with separate records for Clients and Contacts) requires two passes for a complete import.

You add new records by filling in blanks on each of three forms separated by folder tabs: basic information, user-defined fields, and second mailing addresses. When you add a Contact to a Company Client, matching information is duplicated on a blank Contact form.

Completed interaction with contacts, like phone calls, tasks, and correspondence, moves automatically to the Journal (similar to the history log in other contact managers) or the Notes windows or both, depending on

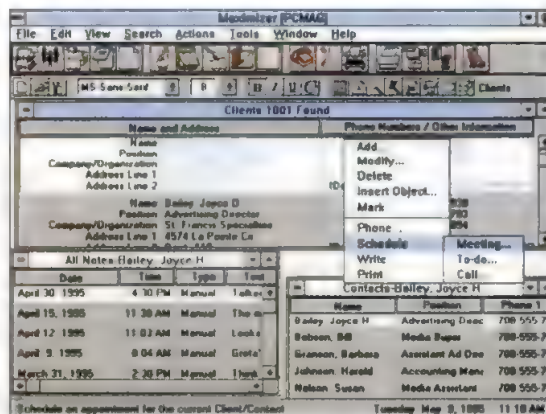
your preference. Modifiable pick lists help you quickly document the results of individual interactions.

Maximizer indexes a generous number of fields, 23, which allows fast, focused searches. Unfortunately, there's no way to search every field in your database simultaneously (which some other products do allow), and you can only do Boolean searches within Maximizer's user-defined fields (formerly called *categories*). Pre-defined UDFs don't include commonly used search fields like state, and if you add them, you'll have to reenter the data in each record's UDF. You can stack (progressively refine) searches to achieve the same result, however.

Standard scheduling features have some nice adornments. In addition to an adjustable calendar, alarms, and generous recurring meeting options, you can choose an icon to represent the appointment and search for free time. LAN users can look at coworkers' schedules and enter a meeting on their calendars but can't automatically send invitations or RSVPs through Maximizer's e-mail system. Privacy options are good: You can keep other users from seeing schedule details, and earmark meetings as private.

Maximizer offers fewer task-management options, though you still can prioritize to-dos, find available time, set alarms, mark tasks done, and designate tasks as personal. Tasks appear in the Hotlist, along with time-sensitive reminders of pending activities like phone calls.

We were limited in our evaluation of



As you scroll through your client list, Maximizer lets you select windows that display added information.

Workgroup Contact Managers

network functionality by the absence of MaxExchange, which should be released by the time this review appears. MaxExchange handles the all-important data replication and synchronization between remote copies of the contact database, supplying the finishing touch for Maximizer's otherwise good network functionality.

Maximizer offers fewer task management options. You can prioritize to-do's, find available time, set alarms, and mark them done, but you can't earmark them personal. Group task management is nonexistent.

Maximizer offers two ways of automating actions: simple macros and Action Plans (a feature of MaxAction). The latter lets you establish rules for follow-up with contacts to trigger reminders of actions needed at specified intervals.

A reputation for being difficult to use has dogged Maximizer, but this has changed substantially in the current release. The product's two-tiered database approach and multiple-window architecture make it a powerful tool in the right hands, but confusing in others. Further, its workgroup features still lag behind those of the pace setters. Still, Maximizer's innovative approach, wealth of features, and understandable menu system and language keep it near the top of its field.

FACT FILE

Maximizer 3.0

List price: \$149; 5 Users, \$745 **Requires:** 4MB RAM, 10MB hard disk space **In short:** Maximizer is a list-based contact manager, making it a potentially powerful tool for linking unlimited contacts to clients. But it is more difficult to use than some of its competitors. Although its usability has improved over the last 2 years and its features compete well with market leaders, it lags behind the best in workgroup functionality.

Modatex Systems International, One Spurling Plaza
12850 Spurling Dr., #250, Dallas, TX 75230, 800-804-6299, 214-308-0001, fax, 214-308-0011

528 on reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Excellent	Good
Personal scheduling	Good	Excellent
Correspondence	Excellent	Excellent
Workgroup	Good	Good
Remote	Good	Fair

SuperOffice Corp.

SuperOffice 3.0

BY BARRY BRENESAL

When SuperOffice Corp.'s SuperOffice 1.0 first appeared several years ago, it was a light-featured, low-end information manager, redeemed largely by a lack of comparable Windows-based products. Now in its third release, SuperOffice 3.0 (\$219; after 10 users, \$199) still has some deficits in the features and ease-of-use departments, but the program's new networking and group scheduling options give it some added muscle.

SuperOffice's installation requires little beyond inputting a serial number, user name, and password. When using the program, you perform most actions from the Company and Diary screens. The former displays contact records as groups of tabbed Rolodex cards, the first of which—"All"—contains basic contact information. Other members of the Company cards groups are Projects, which stores timed activities that group various companies, activities, and priorities, and Selections, which are non-time-related. You can customize the Company cards to hold additional user-defined fields—up to 2,000 characters worth—configured almost any way you choose.

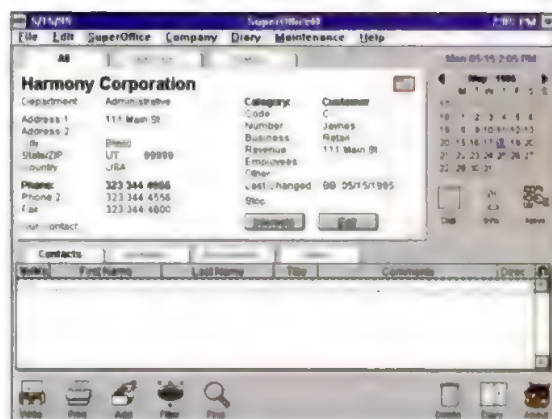
DEAR DIARY

The Diary screen (somewhat confusingly named) is SuperOffice's new daily and weekly calendar feature. It is well-organized, and you can customize any of the five fields in the to-do list (company, type, text, completed by, priority), which is a nice touch. You can also drag-and-drop activities within the Diary, but you can't drag them between the Company and Diary screens. This reveals one of SuperOffice's main flaws: You can't load the program's two main modules simultaneously, and this is just one of several similar drawbacks of a product competing in a market where ease of use is as important as features.

Besides the to-do list in the Diary and the user-defined additions to Company

card groups, very little in SuperOffice can be customized. Generally, the program falls far short of the customizability of GoldMine or Telemagic. A partial exception to that is SuperOffice's enhanced report mode, which allows you to reset margins, select fonts, and set up the page layout.

Above all, SuperOffice's Import/Export function needs an overhaul. SuperOffice shows the data fields available for import but not the current fields they



SuperOffice's unintuitive interface and nonstandard menus and button bar come between the user and the features.

have to fill. This means you must first make a manual list of your current database fields in their proper order before importing any database files.

Not only is setting up your database for import cumbersome, but merely locating the Import/Export command brings an unpleasant surprise: It's under the Maintenance menu, rather than File. This is a good example of how nonstandard and unintuitive SuperOffice's menus are. Luckily, however, SuperOffice's documentation is first-rate, with separate tutorial and installation guides and context-sensitive help.

SUPERNETWORKING

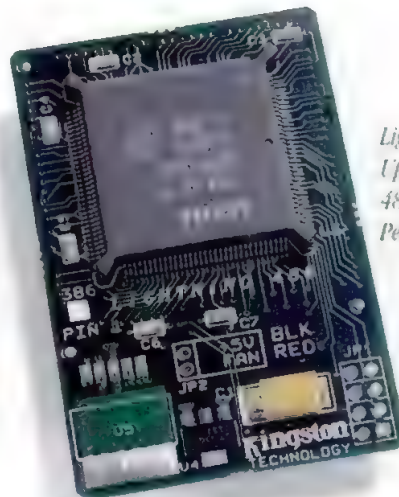
On the networking side of the equation, SuperOffice is at least competent. Like the other products in this review, it supports all file-sharing networks and can run from a shared volume with server files protected from user overwrites.

Of all the products that we looked at in this roundup, SuperOffice is one of the few products we tested that supports in-depth group scheduling, among other things displaying a combined view of all group members' calendared events—

Triple Your PC's Speed For Only \$295



TurboChip™ Upgrades 486 PCs to 100MHz Performance



Lightning 486™ Upgrades 386DX PCs to 486 66MHz Performance

Remember when your 486 or 386DX was the hottest PC around and blazed through all your jobs? Today it's being pushed to the limit by a new generation of sophisticated software. Sure, you can throw a lot of money at a newer, faster system. Or you can do something smarter and far more affordable—install Kingston's new processor upgrades: TurboChip™ in your 486 system or Lightning 486™ in your 386DX system.

Just what kind of performance increase will TurboChip and Lightning 486 offer? Take a look at the results and see for yourself—up to a spine-tingling 565 percent speed increase. That's speed you can only dream about now—guaranteed to make your DOS, Windows and OS/2 applications fly.

Isn't it time you enjoyed the thrill of power again—without having to pay a fortune? Give Kingston a call today and we'll make it happen.

TurboChip Increases Your Performance Over 190% IBM ValuePoint DX33

Application	Native	With TurboChip	Performance Increase
Microsoft Excel *	38 Seconds	17 Seconds	123%
Microsoft Word **	50 Seconds	30 Seconds	66%
Landmark Speed v2.0	112MHz	332MHz	196%

Lightning 486 Increases Your Performance Over 550% IBM PS/2 Model 70

Application	Native	With Lightning 486	Performance Increase
Microsoft Excel *	2 Min., 37 Sec.	41 Seconds	282%
Microsoft Word **	2 Min., 26 Sec.	59 Seconds	147%
Landmark Speed v2.0	23MHz	153MHz	565%

* Kingston conducted a test on an IBM Microsoft Excel for Windows 5.0 spreadsheet in which a numerical equation was changed in a cell. Once the equation was altered, Excel was instructed to recalculate the entire spreadsheet by using the "Fill Down" command. Measured in amount of time, lower is better.

** Kingston conducted a test on a 638KB Microsoft Word for Windows 6.0 document in which the word "the" was replaced with "Kingston Technology". Once the word was changed, Word was instructed to edit the document by using the "Replace All" command. Measured in amount of time, lower is better.

(800) 337-3709



Kingston Technology Corporation, 17600 Newhope Street, Fountain Valley, CA 92708 USA (714) 435-2600 Fax (714) 435-2699
Look for us on the Internet • <http://www.kingston.com>

© 1995 Kingston Technology Corporation. Kingston Technology is a Registered Trademark of Kingston Technology Corporation. All rights reserved. All Trademarks and Registered Trademarks are of their respective holders.

PC MAGAZINE CIRCLE 106 ON READER SERVICE CARD

Workgroup Contact Managers

which is invaluable when you're trying to schedule a meeting. SuperOffice also tracks resources such as conference rooms, slide projectors, and the like. You can also send meeting notifications and receive accepting or declining responses.

SuperOffice's security is not stellar, but it's decent. The package supports individual passwords, and each user can keep private history data and notes within a public record. No address information can be kept confidential, but to-do lists, Diary activities, sales reports, and documents can be set to private, group-only, or area-wide access.

Remote database synchronization for SuperOffice is bidirectional and supports changes at either record or field level. The package synchronizes by contact, task, or calendar item. You need to establish all remote users at setup, however; otherwise, changing a user's status becomes an awkward problem for the system administrator.

Although SuperOffice's limited customizability, quirky menus, and lack of drag-and-drop are significant drawbacks, they're counterbalanced to some extent by its group scheduling, resource scheduling, and database synchronization options. If a workgroup contact manager is crucial to your strategic direction, however, SuperOffice is probably not your strongest choice.

TeleMagic Inc.

TeleMagic Enterprise for Windows 1.5

BY NELSON KING

If you're looking for a workgroup contact manager you can mold to your needs without any programming, you might want to consider TeleMagic Enterprise for Windows 1.5 (\$499.95; for five users, \$1,299.95), from TeleMagic Inc.

Almost everything in this package can be customized—data fields, screens, reports, toolbars, communications—thanks to the robust data-management system on which it is built. But this flexibility comes at a price: TeleMagic lacks some of the ready-to-go features of its competitors and the package is most effective when installed and configured by third-party Telemagic specialists.

Although getting up and running with one of the two contact-database templates provided is possible, TeleMagic is clearly more powerful if the database, screens, and reports are tailored for each organization. The package provides some potent tools to do this—a complete screen designer and a powerful report generator, for example—but using them requires both database expertise and familiarity with the product.

POWER VS. EASE

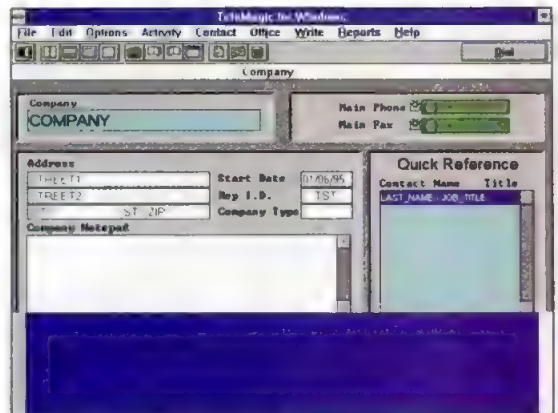
Installing the workgroup features (network, e-mail, telephone, and database synchronization) also demands expertise, partly because of weak documentation and partly because of convoluted procedures. For example, installing TeleMagic on a network requires you to set up users and security groups, which isn't as easy as it sounds (or as it could be). You must set up the users, copy your security permissions to each new user, and then adjust them individually.

Similarly, although database replication and synchronization capabilities are strong, setting them up is touchy. You must copy a set of template files between machines, then build a database from the template. Moreover, the documentation suggests that data not be dis-

tributed to more than one remote site at a time. This can be avoided if data is filtered appropriately for each remote user, which—though it solves one problem—can create others.

FUNCTIONAL RELATIONSHIP

TeleMagic is built on a relational database system (Microsoft FoxPro), which carries over to its contact-management screens. The product features three windows that



TeleMagic's main contact screen can be extensively customized, even down to the data fields and the layout.

are typically configured as Company, Contact, and Product (although titles and content can be customized). Each of these windows represents a level that corresponds to the underlying relational database. The approach is easy to understand and quite responsive.

TeleMagic leverages the database capability by allowing searches and filters (selection criteria) of almost unlimited complexity. In general, database-related aspects of contact management—data entry, logging and tracking, and data import or export—perform well even with a large number of contacts.

Creating contact groups in TeleMagic is a bit quirky. Also, groups have a different significance in TeleMagic than in most competing products: They're not used to distribute information, schedule events, or do anything except organize security permissions. While it's possible to customize groups for other purposes, this should be more integral to the program.

TeleMagic has competent schedule, calendar, and to-do list capabilities. It lacks the refinement found in some contact-management programs (for instance, it can't search a schedule to find open times for a meet-

FACT FILE

SuperOffice 3.0

List price: \$219; each after 10 users, \$199 **Requires:** 6MB RAM, 5MB hard disk space **In short:** SuperOffice has some powerful networking features—group-scheduling support, remote database synchronization, and strong security. But its nonstandard menu choices, poor reconfiguration options, and unintuitive interface makes this information manager singularly difficult to use. There are no right-click context-sensitive menus, and even simple changes to a record are more complex than they should be.

SuperOffice Corp., 128 Great Rd., P.O. Box 354, Bedford, MA 01730, 800-328-6868, 617-275-2140; fax, 617-275-6921.

530 on reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Fair	Fair
Personal scheduling	Fair	Good
Correspondence	Fair	Good
Workgroup	Fair	Good
Remote	Fair	Fair

With record revenues and awards for our 64-bit graphics accelerators, ATI is at the top of our game. Now we share that success with you by lowering the prices on our GRAPHICS XPRESSION, WINTURBO and GRAPHICS PRO TURBO products.

With renowned hardware and driver quality, you can be assured of winning performance. ATI's 64-bit accelerators provide vivid colors, high resolutions and lightning speeds in Windows*, DOS, Windows NT, OS/2 WARP, UNIX, DOS, AutoCAD and more. Plus, we're ready for Windows* 95 too.

Take a look at just a few of the over 70 prestigious industry awards ATI has won in the last three years. Recently ATI's GRAPHICS XPRESSION was the only graphics accelerator in 54 tested to win PC Magazines Editors' Choice...winning out over more expensive offerings from Diamond and Matrox.



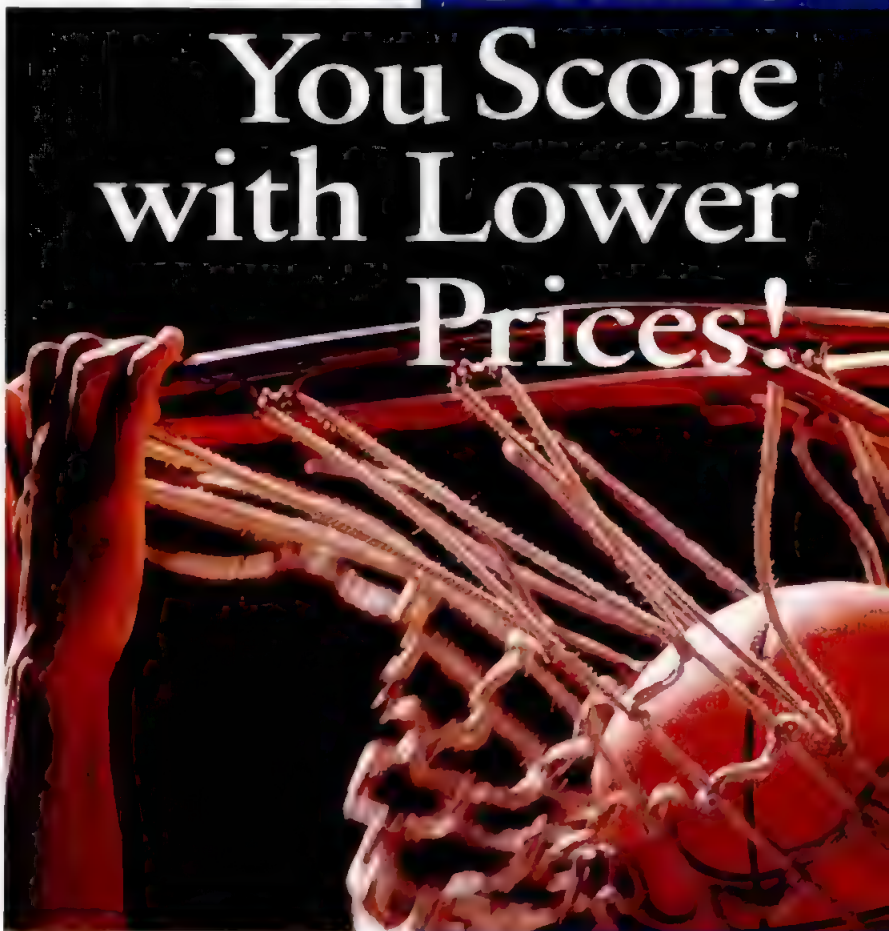
You'll score with a multitude of features which include:



- easy installation
- up to 1280x1024 resolution
- 16.7 million colors
- integrated video acceleration
- color and resolution switching within Windows
- up to 100Hz flicker free display
- extensive Windows utilities, including monitor adjustment, color calibration and control panel
- ISA, PCI and VESA Local Bus versions.

ATI's graphics accelerators...the winning combination. Great performance, lower price and a full five year warranty.

At the Height of Our Game You Score with Lower Prices!



PRICE REDUCTIONS*



DRAM	GRAPHICS XPRESSION	1MB	\$159
		2MB	\$219
VRAM	WINTURBO	2MB	\$349
	GRAPHICS PRO TURBO	2MB	\$399
		4MB	\$599

To find out more about this winning combination contact us at:

FaxInfo Line to receive literature (905) 882-2600 Press 2: on CompuServe at GO ATITECH 76004.3656:
or on the Internet: <http://www.atitech.ca>

Copyright ATI Technologies Inc. ATI, mach64, GRAPHICS PRO TURBO, GRAPHICS XPRESSION and WINTURBO are trademarks and/or registered trademarks of ATI Technologies Inc. All other product names are trademarks and/or registered trademarks of their respective manufacturers. Features, prices and specifications are subject to change without notice. *All prices are suggested retail prices. Dealer may sell for less.

CIRCLE 127 ON READER SERVICE CARD



Perfecting the PC

ATI TECHNOLOGIES INC.
33 Commerce Valley Drive East
Thornhill, Ontario Canada L3T 7N6
Telephone: (905) 882-2600
Facsimile: (905) 882-2620

Workgroup Contact Managers

ing), but it provides good links to the contact-management side of the program.

In fact, the overall integration of contact-management elements is quite good. TeleMagic can be easily linked to a modem, so you can dial phone numbers and log and track all your calls, even the uncompleted ones. TeleMagic also has word-processing mail-merge with logging capability (supporting Ami Pro, WordPerfect, and Word for Windows) and comes with its own e-mail system. It doesn't yet have fax capability, a deficiency that will be addressed in a new version scheduled for release toward the end of this summer.

TeleMagic positions itself as an enterprise-level workgroup contact-management solution that is more economical than a product requiring custom programming but more flexible than traditional PC contact managers.

Because of its dealer network (the people who sell, install, configure, and train for the company), TeleMagic offers a level of support that isn't found in similar products. But in this rapidly evolving category, other more complete, more sophisticated products that can also be highly customized are making it tough for TeleMagic. The current version doesn't strike quite the right balance between customization and native capability—a shortfall that needs to be addressed in the next release.

► FACT FILE

TeleMagic Enterprise for Windows 1.5

List price: \$499.95, 5 users, \$1,299.95 **Requires:** 8MB RAM, 10MB hard disk space **In short:** TeleMagic uses strong database-management capability to provide performance and flexibility for large-scale workgroup contact management. Although it can be extensively customized, doing so requires considerable expertise (often from a TeleMagic dealer). In some areas of the program, TeleMagic should have less customization and more basic capability.

TeleMagic Inc., 17950 Preston Rd., #800 Dallas, TX 75252, 800-835-6244, 214-733-4292, fax, 214-733-4251

531 in reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Excellent	Fair
Personal scheduling	Good	Fair
Correspondence	Fair	Good
Workgroup	Fair	Fair
Reminders	Good	Good

Tracker Software Inc.

Tracker for Windows 2.0

BY GREGG KEIZER

Top-flight workgroup talents and a database flush with user-defined fields may initially attract you to Tracker Software's Tracker for Windows 2.0 (\$349; five users, \$599), but its complex organization and operation may make you wish for something simpler. But if you're willing to wrestle with it, you're rewarded with a robust workgroup contact manager.

Like GoldMine, Tracker was designed for, not adapted to, networks. Installation is a snap, both on a server and at user workstations, though an administrator should be on hand to define such things as groups and access rights. Tracker offers more network configuration options than the other reviewed packages, including tools for managing the aforementioned creation of groups and access rights.

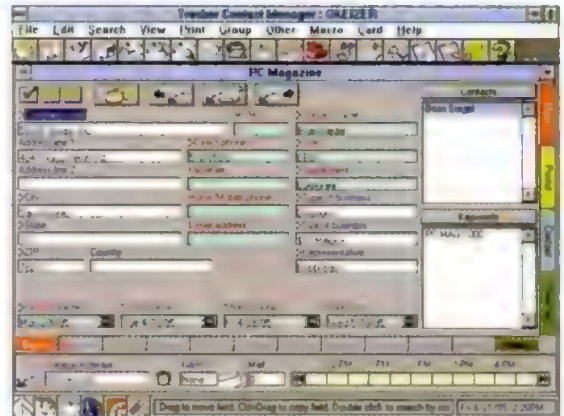
The package's interface, however, leaves much to be desired. Tracker divides the major contact-management components—contact database and scheduler—into separate applications. This prevents you from performing tasks like dragging contacts to the calendar for appointment linking. Moreover, these modules don't share a common toolbar, their screens are cluttered, and information can easily be hidden and made inaccessible when you alter screen elements (by adding a History view, for example).

The interface does have some welcome aspects, however. File-folder tabs lead you to various pages of the contact database and the notes fields, the calendar supports drag and drop, and a status section highlights the day's activities.

NUMBERS OF NAMES

This package's contact database is eminently customizable, and with 75 fields (over half of which are user-definable), there's plenty of room for information. Importing en masse or adding single contacts is easy, though the import process is slow. Tracker associates contacts with companies—a box at the side lists the

other people in your database who also work for the company of the currently open contact—making it easy to locate alternative contacts. Tracker also lets you tag individual contacts for grouping and has provisions for keyword associations, so you can later retrieve such groups. Call logging, however, is not au-



Tracker's contact database includes a wealth of user-definable fields and organizational folder tabs.

tomatic; to log and time an action, you must click an icon and select from a definable list.

Tracker offers many search tools. The easiest lets you type strings in a number of fields (such as Company, Contact, and City); a more sophisticated mechanism culls contacts by selecting from a slew of criteria, including keywords, note con-

► FACT FILE

Tracker for Windows 2.0

List price: \$349.00, 5 users, \$599 **Requires:** 4MB RAM, 10MB hard disk space **In short:** Tracker manages to pack considerable punch, particularly when it comes to group scheduling, database synchronization, and contact customization. But rough edges—including several bugs, a separation of time and contacts into different applications, and overly confusing dialog boxes—ultimately make that power tough to handle.

Tracker Software Inc., 7575 Golden Valley Rd., #375, Minneapolis, MN 55427, 800-925-9950 ext. 9020, 612-525-9802, fax, 612-525-9825

532 in reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Good	Fair
Personal scheduling	Good	Fair
Correspondence	Good	Fair
Workgroup	Excellent	Good
Reminders	Good	Good

Workgroup Contact Managers

tents, history log, and fields. Although Tracker's search options are powerful, they're also intimidating, especially to new users.

Database reconciliation and synchronization, especially between desktop and portable, is excellent. Only LAN transport is well supported; you can't synchronize via floppy disk or e-mail except through an awkward, undocumented workaround. Through a series of dialogs, you determine exactly what gets synchronized.

MAKE MY DAY

Scheduling both personal and group time in Tracker suffers from the same struggle between power and ease. The program supports several views, drag-and-drop appointment changes, a 16-item appointment-category list that can be customized, and appointment-to-contact links. Such links can be established with single contacts or a group through the appointment dialog. But creating recurring appointments is awkward; the command is available only through the menu, not from the graphical calendar.

Group scheduling is more impressive: Notifications are sent via e-mail, and meetings can be created for individuals, a single group, or a collection of groups. A Free Time view shows all users' schedules, but alas, a bug in the free-time search tool prevents it from accurately selecting free blocks of time. The program's task management is simplistic but provides for priorities and tracks canceled chores.

Like most other contact managers, Tracker has limited ability to handle free-form information. Although the program links multiple notepads to each contact, it can't link contacts with external files or accept embedded objects. Tracker's reporting skills are bare-bones, but its correspondence connections, to both its internal word processor and to several leading external word processors, are top-notch.

For all its skills—group scheduling and a customized contact database especially stand out—Tracker has a steep learning curve and is puzzling to operate. Powerful and packed with features though it may be, other packages do just as much as Tracker and do it much more efficiently.

WinSales Inc.

WinSales 2.1

BY NELSON KING

Many contact-management programs leave you feeling that activities like phoning and mailing are almost peripheral, but WinSales, Version 2.1, from WinSales Inc. (\$495; five users, \$1,495), pushes all contact activities front and cen-

ter. Whether it's assigning a sequence of activities to one contact or allocating one activity to a group of contacts, WinSales excels in managing the events of a continuing sales relationship. Where it does not excel is in providing communication channels, which is exemplified by the lack of e-mail and fax support. WinSales also loses some of its focus in the user interface, where a profusion of open windows and dialog

Full Internet support.

Access to the Star Trek Technical Manuals.

And full-featured communications and fax software.

The quickest way to get a message to the Speaker of the House.

Netscape Navigator™ WWW browser. News Reader. Gopher. Internet Mail.

The quickest way to get a message to Elvis.

Access to more services than any other comm software.

Heated debate on cold fusion theories.

Access to BBSs. Corporate hosts. Other PCs.

Even more heated debate on Chia Pet™ care.

Only one box has it all. The new Crosstalk for Windows, v2.3.

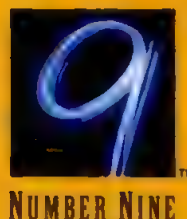


For just \$99 you can get all of the information superhighway in one box.

For \$99 you can get the latest version of Crosstalk™ for Windows -- the world's most award-winning comm software, and the only one that gives you access to BBSs, online services and host computers, plus *full-featured* access to the Internet and fax capabilities. Trade in your old comm software and get version 2.3 for \$49. To add Crossfax™, a *Windows Magazine* Top 100 winner, just add \$20. Call **800-426-6283**, code 36.22. And get it all with a no risk, 60-day money-back guarantee.

 **Attachmate**

Or call 206-644-4010. Offer good in U.S. and Canada only. ©1995 Attachmate Corporation. All rights reserved. Crosstalk and Attachmate are registered trademarks of Attachmate Corporation. Windows is a trademark of Microsoft Corporation. Netscape Navigator is a trademark of Netscape Communications Corporation.



**IF YOU THINK YOUR
YOUR PC'S PERFORMANCE,**

**GRAPHICS CARD ISN'T AFFECTING
WE'D LIKE TO STRAIGHTEN YOU OUT.**



You've got a Pentium. And a quad speed CD-ROM that smokes. But here's the twisted truth: your graphics card is probably slowing down your PC, big time. That's because most PCs today come with a wimpy graphics card. Not nearly powerful enough to deal with high-end multimedia, or to efficiently handle Windows® 95. That's why you need a Number Nine graphics accelerator, such as our award-winning 9FX Motion™ 771. It's available with either 2 or 4MB of VRAM. And it's the easiest, most dramatic way to increase your PC's performance. By giving you high quality, full screen video playback. Increased speed. And the sharpest possible images, with 16.8 million colors and refresh rates up to 150Hz. For more information, see your computer dealer, or call us. And stop sucking air.

**For The Straight Story,
Call 1-800-GET-NINE**

Available At: **Computer City** (1-800-THE-CITY)
CompUSA (1-800-COMP-USA)
Also available in the **Dell Dimension** line (1-800-862-3355)

9FX, 9FX Motion, and Number Nine Logo are trademarks of Number Nine Visual Technology Corporation.
All other trademarks are the property of their respective companies. ©1995 Number Nine Visual Technology Corporation.

PERFORMANCE RAISED TO THE POWER OF 9.



Workgroup Contact Managers

boxes muddles basic procedures.

In the course of this review, we looked at a prerelease copy of Version 3.0 and found that several of the current version's shortcomings have been addressed. The new version should be available by the time you read this, so we'll comment selectively on significant improvements.

The setup for workgroup operation begins in the System Administration module (a separate program), where the procedures are typical: Install on a network, define users, establish database security, and configure various options.

Installation and setup require some experience with network and database ad-

WinSales has a clear sales and marketing slant, stressing what a specific sales rep does in a campaign.



a lineup of 13 activity folders, each containing the records for the current contact. Because you have to open the folders to look at data, you can quickly have six to ten windows floating around the screen, which gets messy. Launching other procedures adds to the confusion by opening still more windows. Fortunately, WinSales 3.0 has tackled the window proliferation problem by converting to a tabbed dialog design, which gathers related material behind tabs like an index file—a big improvement.

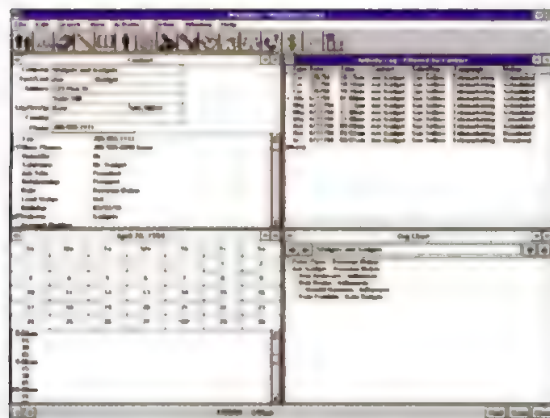
In the current version, scheduling is almost an afterthought, with a notably bare-bones look and the absence of workgroup scheduling. Workgroup schedul-

ing capability, which isn't fancy but probably doesn't need to be. WinSales also has a Fulfillment module where batches of correspondence (letters, and labels) can be sent for printing management.

DO IT YOUR WAY

WinSales has maintained a high degree of customizability: Users can define virtually every field and every screen. Likewise, a system administrator can define activities, telemarketing scripts, and a host of other data sources such as regions, product lists, and seminars. Customization also extends to reporting, where WinSales has both an on-the-fly reporting capability (put a configuration of windows on the screen and WinSales will make a report out of it) and a full-scale report generator.

The current version of WinSales has much to offer (features like Action Plans are truly important to sales-oriented users), but the effectiveness of the program is hampered by some missing capabilities and design problems. One should understand that WinSales' structured approach is at times complex and has a discernible learning curve. WinSales is already one of the strongest programs for organizing the sales aspect of workgroup contact management. And the additional features and redesign in Version 3.0 may well qualify WinSales as one of the category's powerhouses. □



WinSales' multiple-document interface makes it easy to organize multiple activities for each contact.

ministration, in part because documentation and ease of setup are uneven: The product has simple but thinly documented network features and limited data import capability (it supports only ASCII files).

WinSales has a sales-centric methodology that makes it operate differently from other contact-management programs. For example, contact entries include fields for Salesrep and Campaign.

This is a consistent sales and marketing orientation, emphasizing what a specific sales rep does with contacts in a campaign. The main tools in the WinSales approach are activities applied to one or more contacts: In-bound Call, Out-bound Call, Product Order, Seminar Registration, Correspondence, Meeting, Product Registration, Service Call, Expense, To-do, Telemarketing Script, Survey, and Sales Opportunity.

WINDOWS GALORE

The main (contact) window also conforms to this sales-centric approach, presenting

ing is another area greatly improved upon in the new version, which features a graphical group calendar and e-mail integration.

WinSales' task-management features are far more successful. First, the package provides Templates, which is a way for activities (like mailings) to be executed (or logged) for each contact in a group defined by a query. Second, WinSales can create a sequence of activities (like a mailing, a follow-up call, and a demonstration) that can be applied stepwise to any contact. This is called an Action Plan and is an effective way to orchestrate contact relationships. Third, Action Plans have some ability to adjust to events (like meeting cancellations). But the new version vastly increases this capability with event "triggers" that can be customized by programming.

EXTRA CREDIT

Action Plans play a unique role but are just one of WinSales' unusual features. The package also includes an integrated

► FACT FILE

WinSales, Version 2.1

List price: \$495, 5 users, \$1,495 **Requires:** 4MB RAM, 7MB hard disk space **In short:** WinSales is a strongly sales- and marketing-oriented program that emphasizes the management of tasks and events for groups of contacts. It has numerous unusual features, notably Action Plans for orchestrating contact events, but is hampered by the lack of some workgroup features such as e-mail support and group scheduling. A new version, WinSales 3.0, promises to remedy these shortcomings.

WinSales Inc., 3605 132nd Ave. SE, #312, Bellevue, WA 98006, 206-747-2464, fax, 206-747-2955

533 Win reader service card

SUITABILITY TO TASK

	Power	Ease
Contact database	Good	Good
Personal scheduling	Good	Good
Correspondence	Fair	Good
Workgroup	Poor	Fair
Remote	Fair	Good

Which Database is Easier to Use?

Access vs. Alpha Five

50 Lines of Code

Microsoft Access

If this looks tough, you may want to pick up a few books about Access programming.

```

' From the general declarations
Dim source_id As Integer
Dim start_quantity As Double

' setting the values before the fields.....
Sub quantity_BeforeUpdate (Cancel As Integer)
    source_id = Me![itemID]
    start_quantity = Me![Quantity]
End Sub

' After update
Sub quantity_AfterUpdate ()

' declaring the variables used in this function.....
Dim CURRENT_db As Database
Dim ON_HAND_dbl As Double
Dim PRODUCTS_rst As Recordset
Dim VAL_var As Variant
Dim NEW_PRODUCTID_ing As Long
Dim NEW_QUANTITY_ing As Double
Dim product_qdf As QueryDef

' getting the new values.....
NEW_PRODUCTID_ing = Me![PRODUCT_ID]
NEW_QUANTITY_ing = Me![Quantity]

Set current_db = dbEngine.Workspaces(0).Database(0)

NEW_PRODUCTID_ing = Me![PRODUCT_ID]
NEW_QUANTITY_ing = Me![Quantity]

' undoing the changes that were made to the products database
Set product_qdf = dbCurrent.OpenQueryDef("Undo_previous_update")
product_qdf.Parameters(0) = Quantity_dbl
product_qdf.Parameters(1) = PRODUCTID_ing
product_qdf.Execute
product_qdf.Close

' sending new update to the products database
Set product_qdf = dbCurrent.OpenQueryDef("Update_products")
product_qdf.Parameters(0) = NEW_QUANTITY_dbl
product_qdf.Parameters(1) = NEW_PRODUCTID_ing
product_qdf.Execute
product_qdf.Close

End Sub

' after del confirm
Sub Form_AfterDelConfirm (Status As Integer)

Dim VAL_var As Variant
Dim products_qdf As QueryDef
Dim current_db As Database

Set dbCurrent =
dbEngine.Workspaces(0).Databases(0)

var_val = RenumDetail()

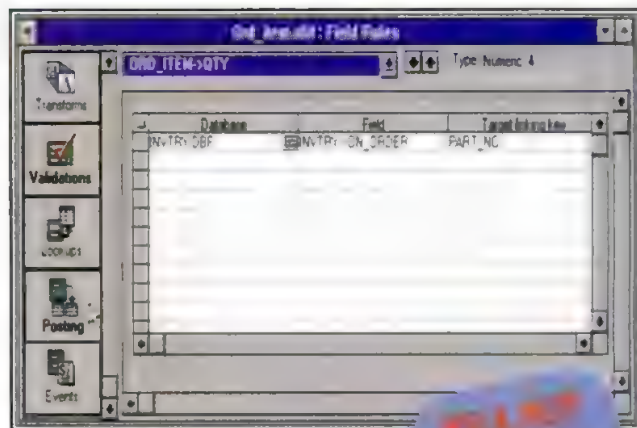
' To update the inventory,
run the query to add the old items back in
Set product_qdf =
Current_db.OpenQueryDef("undo_previous_update")
qdfInventory.Parameters(0) = Quantity_dbl
qdfInventory.Parameters(1) = productid_ing
qdfInventory.Execute
qdfInventory.Close

End Sub
    
```

One Easy Table

Alpha Five

Just fill in the table. That's all there is to it!



See how easy it is to accomplish the same task in Alpha Five.

Compare how Alpha Five and Access both perform order entry with live inventory updates. This is just one example of how Alpha Five is the only database that truly delivers on the promise of power and ease of use. If your time is valuable, try Alpha Five. Alpha Five is available at your local reseller. Or, call us for a FREE trial Alpha Five (\$9.95 shipping and handling fee).



Call for Free Trial **1-800-451-1018**, ext. 555

CIRCLE 196 ON READER SERVICE CARD

ACT



Alpha Software Corporation

168 Middlesex Tpk. • Burlington, MA 01803 • 617-229-2924 • FAX 617-272-4876

SOLD AT: CompUSA • Egghead • Electronics Boutique • Babbages • Software Etc. • Fry's Electronics • Computer City • Lechmere • Staples • Office Depot • Incredible Universe • Best Buy



THE ART OF BEING REMOTE

By Frank J. Derfler, Jr.

Remote access is about working from anywhere. It is about sales reps using tools from customer sites or road warriors working from hotel rooms. That's the user view of remote access.

Network managers see it differently. They see security holes, reliability headaches, and enough management anguish to make the toughest whimper.

If you're not already living managers' nightmares or realizing users' dreams, you will be soon. With 7 million laptops sold last year alone, users will want to power up and dial in. And companies should encourage them: A recent study shows that telecommuters enjoy a 10 to 30 percent increase in productivity while saving companies \$3,000 to \$5,000 annually.

Curing those nightmares and achieving those dreams means finding the remote-access solution that's right for you. With

dozens of vendors and hundreds of products, that's no simple task. So we went out and reviewed the most popular remote-access approaches.

Our first article, "Access and Control," takes a hard look at nine Windows- or OS/2-based *remote-control* packages that are great solutions for letting remote users run applications and pull files from an office PC.

The second article, "Remote Node: Hello LAN," examines 13 *remote-node servers* that make your remote laptop another device or node on your office network. This is the best way for multiple users to dial in to the office.

Along the way we'll touch on other solutions, such as *file-transfer utilities* and *remote-control servers*. We'll tell you the inside secrets and the untold truths for finding the remote-access solution for you.

THE ART OF BEING REMOTE ACCESS AND CONTROL

When you need to get to files and applications on your desktop, remote-control software remains king.

By Frank J. Derfler, Jr.

Remote-control products change the balance of power. Through remote control, someone using a modestly powered laptop can enjoy the services of the most powerful desktop PC. You particularly need remote control instead of remote node if you crunch big numbers,

ripple through databases, provide customer support, or run job-specific applications tied to files on a server. Remote control also is typically the choice for network-management tasks, like remote application troubleshooting.

The singular drawback to remote control is that it changes how you work. Under remote node, your style of opera-

tion stays the same wherever you are, but under remote control, your activities and files reside at the other end of the modem link.

In this roundup, you'll find seven products for Windows and two for OS/2. Probably the best thing we can say is that some of the products in our review are less likely to cause system problems than others. Remote-control client software intercepts keyboard and mouse inputs and sends them across a modem link. The software on the host receives those inputs and sends screen images back. Many remote-control programs integrate into the client PC by replacing drivers, loading TSRs, modifying configuration files, or otherwise endangering the seamless harmony you've established on your PC.

But a few products—namely Symantec's Norton pcAnywhere 2.0 for Windows and Stac Electronics' ReachOut 5.0 for Windows & DOS—cause much less disruption. You'll find both products topping our Editors' Choice box.

Remote-Access Alternatives

Should you go for a remote-control or a remote-node solution? Actually, the decision is a bit more complex. Besides the two major remote-access approaches, there are a few other techniques. Here are the key alternatives that you'll need to consider when constructing your company's remote-access strategy.

■■■ Data ■■■ Application

FILE-TRANSFER UTILITIES

What they are: Software that moves files between PCs via a modem or cable. Most remote-access products include file transfer.

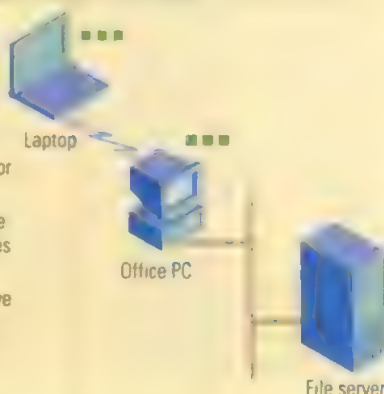
Sample products: HotDisk, LapLink for Windows, LapLink V for DOS, PowerSync

Who would want them: Remote or local users who want to get files to or from a PC

Benefits: Easy to use, inexpensive

Drawbacks: Can't run applications remotely or provide on-line access

Cost: \$50 to \$140 (with cable)



COMMUNICATIONS SOFTWARE

What it is: Software that can connect to on-line services. Most packages can make your PC a BBS so you can send and retrieve files.

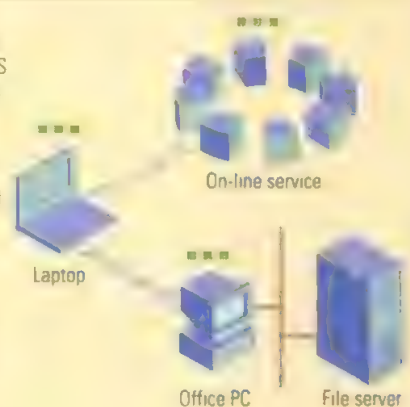
Sample products: CrossTalk, HyperAccess, Procomm Plus

Who would want it: Frequent users of on-line services who need remote-control features

Benefits: A single communications package

Drawbacks: Limited remote-control functionality (often DOS only), no remote-node features

Cost: \$200 to \$300



REMOTE-CONTROL SOFTWARE

What it is: Software that lets you dial in to and run applications from a host PC, either over phone lines or over a network.

Sample products: LapLink, pcAnywhere, ReachOut

Who would want it: Customer-support operations or users who want to run applications remotely

Benefits: Economical, lets remote users run network-resident applications

Drawbacks: Limited management, users can't easily save or print files at the host

Cost: \$50 to \$200



Remote-Control Software

REVIEW CRITERIA

All the products in our roundup have undergone recent revisions, and Microcom, Software Corp. of America, and Triton promise newer versions by this summer. Updating is necessary because these products must offer the newest features and work with the latest modems, applications, and system hardware.

In our review criteria we ensured that these products could transfer Windows screens in VGA and SVGA and that they had an integrated way to transfer files. We also feel it is important to be able to control a DOS host. Most of these products work over modems and LANs; see the sidebars "Timbuktu Pro for Windows" and "Modem Central—A Remote-Control Alternative" for solutions that work with remote-node servers.

FEATURE-RICH

Some remote-control products—LapLink for Windows 6.0a, pcAnywhere, ReachOut, and Remotely Possible/Dial 4.0—

deliver *file synchronization*, the ability to update automatically all of the files on a drive or in a subdirectory between the client and host. ReachOut and LapLink

or drives on the remote-controlled PC available to the client PC.

Video adapters with resolutions of 1,280-by-1,024 with 16 million colors or better are becoming more common, but only a few programs, such as LapLink and Remotely Possible/Dial, can move screens of these resolutions. You'll want to make sure the program you buy works with the video setups on both the client and host.

A host PC running in an empty office is ripe for physical intrusion. For maximum security, we recommend using a central pool of machines for remote control or one of the specialized access servers such as those from Cubix or J&L (see the sidebar "And Now for the Megairon").

IN THIS REVIEW

Products reviewed:

<i>Carbon Copy for Windows 2.5b</i>	282
<i>Close-Up 6.0</i>	283
<i>CoSession for Windows 2.0g</i>	283
<i>KopyKat 1.1</i>	286
<i>LapLink for Windows 6.0a</i>	290
<i>The Norton pcAnywhere 2.0</i>	292
<i>PolyPM/2 3.0</i>	294
<i>ReachOut 5.0 for Windows & DOS</i>	295
<i>Remotely Possible/Dial 4.0</i>	296
<i>And Now for the Megairon</i>	290
<i>Modem Central: A Remote-Control Alternative</i>	292
<i>Timbuktu Pro for Windows</i>	299

go further with *delta-file transfer*, the ability to send only changes to a file and not the entire file. Some products offer *printer redirection* and some offer *disk-drive redirection*; these features make printers

NO INTEROPERABILITY

While remote node moves toward interoperability, remote-control products remain proprietary. You must have the proper client software, and typically the correct version, to connect successfully. The incompatibilities between different vendors'

COMMUNICATION SERVER (REMOTE-CONTROL HARDWARE)

What it is: A modular unit containing PCs on expansion boards. Users dial in with remote-control software and run apps on one of the boards.

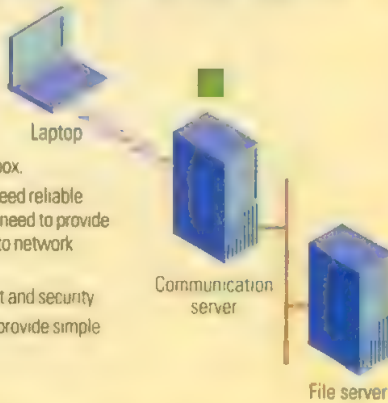
Sample products: Cubix ERS/FT, Evergreen CAPserver, J&L Chatterbox.

Who would want it: Users who need reliable connections or administrators who need to provide multiple remote users with access to network apps.

Benefits: Centralized management and security.

Drawbacks: Expensive, does not provide simple access to an office PC.

Cost: \$15,000 or more.



REMOTE-NODE SERVER—LARGE OFFICE

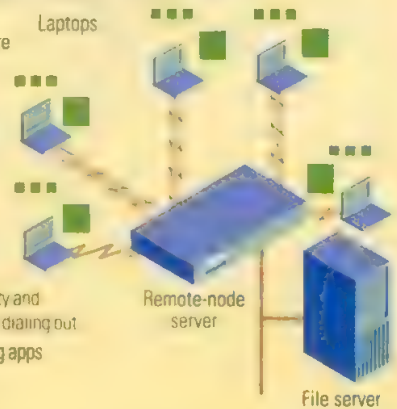
What it is: A hardware/software combination that allows four or more remote users to dial in as if they were at nodes on a LAN.

Sample products: Microcom's LANexpress 4000, Shiva's Lan-Rover/E PLUS.

Who would want it: Administrators who need to support four or more remote users and manage their activity.

Benefits: Expandable, good security and management, can pool modems for dialing out.

Drawbacks: Not suited for running apps off a file server. File transfers are slower than with remote control.



REMOTE-NODE SERVER—SMALL OFFICE

What it is: A hardware/software combination that allows up to three remote users to dial in as if at nodes on a LAN.

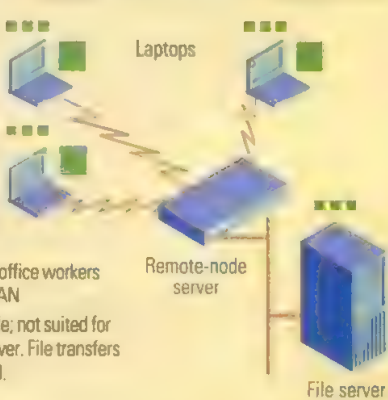
Sample products: Emulex's Connect Plus, Shiva's NetModem.

Who would want it: Administrators who need to provide remote access for up to three users at a time.

Benefits: Good management; lets office workers use modems for dialing out of the LAN.

Drawbacks: Not easily expandable; not suited for running applications off of a file server. File transfers are slower than with remote control.

Cost: \$500 per port.



REMOTE CONTROL OVER REMOTE NODE

What it is: Remote-control software used over a network or over phone lines in conjunction with a remote-node solution.

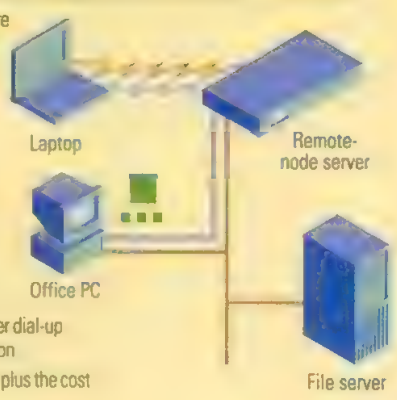
Sample products: pcAnywhere, Proxy, ReachOut, Timbuktu Pro.

Who would want it: Customer-support providers or users who need to run applications on networked PCs or on their laptops.

Benefits: Users can choose the best option for the task at hand.

Drawbacks: Poor performance over dial-up lines; added complexity of installation.

Cost: \$200 to \$300 per remote user plus the cost of the remote-node server.



programs are in how they handle screen and file transmission. Modern programs handle dense graphics by passing Windows Graphics Display Interface (GDI) calls to the remote client. The software receives the calls and redraws the graphics on the remote screen. Programs also cache screen images so they appear quickly instead of being retransmitted. LapLink clearly led

SCREEN SCALING



We really liked screen-scaling features found in *Close-Up* and *LapLink*. Both products shrink a host PC's higher-resolution screens, making it a lot easier to control from the remote PC.

To view screens with higher resolutions with *Remotely Possible/Dial*, you scroll by either using an Alt-arrow key combination or by right-clicking the mouse near the edge of the screen.



the field in screen-transfer efficiency, so if you're running graphical programs on the host, it's a good choice (see "Performance Tests: Remote-Control Software").

Each of the products provides a menu-driven way to move files between the host and client and uses proprietary file designation and compression schemes to speed file transfers. File-transfer and overall performance are both part of the Suitability to Task ratings in each of the reviews.

Microcom Inc.

Carbon Copy for Windows 2.5b

BY ED TITTEL

Carbon Copy for Windows 2.5b, over a year old, is functional but average. Microcom plans to release Version 3.0 by the time you read this, which could be on a par with the category's best products. Planned features include better file-transfer performance, a delta-file transfer option, automatic modem and hardware detection, and an uninstall utility.

Installation hurdles begin with the possibility that you'll be forced to use generic or older device drivers. Carbon Copy insists on replacing the video drivers. It also uses its own mouse driver. Even more galling, the only way to change the initial configuration is to completely reinstall the package.

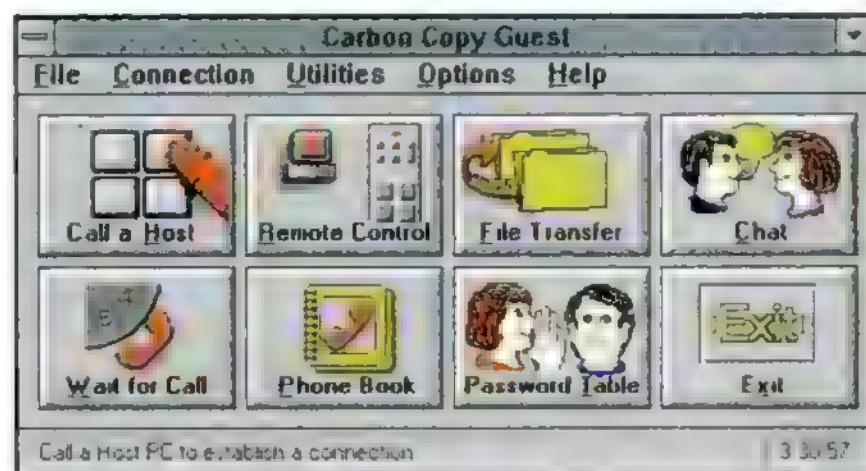
To start a session, launch the host or guest module. Despite the distinction between host (the PC that is being called) and guest (the calling PC), once a connection is established, the guest can control the host machine and vice versa.

Security is limited to username and password access and to preventing users from exiting the host's Windows session

SUITABILITY TO TASK		
Carbon Copy for Windows		
	Power	Ease
Installation and configuration	Poor	Fair
Management and security	Fair	Fair
Remote control	Fair	Fair
File transfer	Fair	Fair

to run DOS. Carbon Copy has no directory-level file restrictions, nor does it let you restrict Windows users from launching an application on the host. The product does have an extensive logging feature and will track connection time by user for billing.

Version 2.5b of Carbon Copy incorporates only a few changes from Version 2.0. For one, file-transfer performance has been significantly increased, and Carbon



The button bar makes switching between tasks easy, but Carbon Copy can't run utilities simultaneously.

Copy scored well on our file-transfer tests. Carbon Copy's background file transfer works well, but you cannot simul-

The Norton pcAnywhere 2.0 for Windows ReachOut 5.0 for Windows & DOS

After much consideration, The Norton pcAnywhere 2.0 for Windows and ReachOut 5.0 for Windows & DOS win our Editors' Choice. pcAnywhere was our Editors' Choice last year and continues to be a solid

performer. ReachOut, an honorable mention last year, now offers the latest remote-control technologies, including delta-file transfer, virus protection, and LAN and remote-node support.

And as it did last year, ReachOut showed some problems during testing. This time around, we found that ReachOut had difficulty transfer-



ring large fonts and hung up certain PCs when exiting Windows. At press time, ReachOut had apparently corrected both bugs. Though neither problem was significant enough to withhold the Editors' Choice, both are important to keep in mind when purchasing the product.

pcAnywhere was more stable. Its ease of use and performance were

about even with ReachOut, as were its security and management options. If you're a network manager who wants the absolute best features and performance, buy ReachOut. But if you don't want to take a chance on a new release and still want to have plenty of functionality, consider pcAnywhere.

Right behind these packages is our honorable mention: LapLink for Windows 6.0a, an excellent choice for individual users. It is the fastest package for running remote applications, but it has average file-transfer performance. It also does an excellent job of adjusting the local screen's resolution to the remote system's resolution. Still, LapLink lacks management and security features a network manager needs, such as a billing log, data and password encryption, and host-resource restrictions.

Remote-Control Software

Suitability to Task:

Remote-Control Software

Remote-control software offers the flexibility to connect to your office via a desktop PC, modem pool, or dedicated communication server.

An effective remote-control solution accommodates needs on both ends of the connection. Remote users require high-speed file transfer, access to office applications, and remote support. An administrator is chiefly concerned with maintaining rapid, reliable, and secure access to information.

The remote user and network administrator look for simple **installation and configuration**. We want wide support for modems and video resolutions. Detection of a system's communication resources adds to a trouble-free installation. Remote-control

SUITABILITY TO TASK		
Product Name	Power	Ease
Installation and configuration	Poor	Poor
Management and security	Fair	Fair
Remote control	Good	Good
File transfer	Excellent	Excellent

applications must not affect resources or compatibility with other applications. We consider whether the packages modify video, keyboard, and mouse drivers or whether they use TSRs.

The office administrator often views outside access to the office systems as a nightmare when considering **management and security** issues. We evaluated how multiple users are configured and what directory and file privileges are available. The ability to track calls for cost accounting or investigate troublesome connections are considered, along with the ability to

lock screen and keyboard functions of the host. Passwords should be encrypted and include user and administrator functions. Data over analog phone lines should also be encrypted and checked for viruses.

Remote-control sessions must allow the remote caller to use all the resources of the host computer. We investigate whether each package can effectively interpret host screens at higher resolutions, direct print jobs locally or remotely, easily map drives for network access, and reboot hung sessions

Connecting to the office for desperately needed files makes **file transfer** a key feature for remote users. Continuation after an unplanned disconnect, directory synchronization, and the ability to send changes only for common files are all factors we weigh in our evaluation. The ability to initiate transfers in the background while working on an application will make calls to the office even more effective

taneously control the host. The remote-access options—remote control, chat, and file transfer—cannot be run simultaneously. The button bar makes switching between tasks easy, but a multitasking capability would improve the product.

Carbon Copy for Windows 2.5b. List price: \$199. Microcom Inc., 500 River Ridge Dr., Norwood, MA 02062-5028; 800-822-8224, 617-551-1000; fax, 617-551-1021; e-mail, remoteaccess@microcom.com.

Circle 501 on reader service card

Norton-Lambert Corp.

Close-Up 6.0

BY ED TITTEL

At its heart, Close-Up remains unashamedly a DOS program but with good Windows-handling abilities. Like several programs reviewed here, it has no major technological breakthroughs compared with its previous version.

The program consists of remote and host modules. While the remote module can run directly in Windows, the host depends on a DOS TSR that must be loaded before Windows is launched. Even more inconvenient and confusing, to change parameters for the host (such as to modify users

and passwords), you must type CHOST EDIT at a DOS prompt.

Close-Up doesn't support the full range of Windows video resolutions—the maximum is 800-by-600 with 16 colors—but it automatically adjusts the host resolution to SVGA for the duration of the session.

Despite its low video capabilities and DOS-centric focus, Close-Up delivers fine Windows functionality, though it placed in the middle of the pack on our file-transfer tests. Because Close-Up doesn't replace any Windows drivers, you're less likely to be hampered with driver problems. Close-Up also lets other applications use the COM ports for which it's configured while the host program remains active in memory—unusual for communications software.

SUITABILITY TO TASK		
Close-Up	Power	Ease
Installation and configuration	Fair	Fair
Management and security	Fair	Fair
Remote control	Fair	Fair
File transfer	Fair	Fair

callback, and you can restrict users to sending or receiving only or to denying access altogether, but Close-Up does not offer the flexibility of directory or file restrictions. It does, however, support ses-

sion logging and individual audit logs.

Close-Up offers satisfactory remote-control and file-transfer capabilities. But its relatively high price, its ungainly DOS/Windows duality, and its middling



Though Close-Up can run directly in Windows, it uses a DOS TSR that must be loaded before Windows is launched.

performance make it a less appealing solution than other products in this roundup. **Close-Up 6.0.** List price: \$199. Norton-Lambert Corp., P.O. Box 4085, Santa Barbara, CA 93140; 805-964-6767; fax, 805-683-5679; e-mail, 77662.327@compuserve.com. Circle 502 on reader service card

Triton Technologies Inc.

CoSession for Windows 2.0g

BY ED TITTEL

It might seem to have all the features you would want for remote control: CoSession for Windows 2.0g can even support multiple simultaneous dial-up and network remote sessions. But CoSession has average file-transfer performance and



**Operating System
Compatibility:**

Novell NetWare
Novell UnixWare
SCO Unix®
Banyan/Vines
IBM OS/2 LAN Server
Microsoft Windows NT AS

\$2,149¹

HP NetServer LC
• 192MB Max RAM
• 12GB Max Internal
Mass Storage
• 6 I/O Slots (2 PCI)
• 66MHz Intel 486 processor

\$3,579¹

HP NetServer LF
• 32GB Max Internal
Mass Storage
• Hot Swap Capability
Standard
• 9 I/O Slots (2 PCI)
• 66MHz Intel Pentium®
processor

\$5,189¹ - NEW

HP NetServer LH
• Dual Processor Capable
• 192MB Max ECC
Memory
• Hot Swap Capability
Standard
• 75MHz and 100MHz Intel
Pentium processor

**HP NetServer Navigator,
Manageability Suite:**

• Configuration Assistant
• Diagnostic Assistant
• Information Assistant

HP NetServer Assistant

Complete software tool set
to help monitor and manage
servers and the network.
Standard feature of HP
NetServer LF and LH models

HP Remote Assistant

Complete remote management
of server regardless of its status.
\$995 list (10 card upgrade) for
all HP NetServer products

¹U.S. list prices as of 8-1-95 for 486/66MHz Model LC, 115 - at price as of 8-1-95 for 66MHz Pentium processor Model LF, 115 - at price as of 8-1-95 for 75MHz Pentium processor Model LH, 115. Upgrade call 1-800-387-3847. Microsoft, Windows and the Windows NT Logo are trademarks of Microsoft Corporation. The Intel Inside and Pentium processor logo are registered trademarks of Intel Corporation. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited. ©1995 Hewlett-Packard Company PHC418





Upon reflection,
there's no better way to
manage the cost of
running your network.

*Presenting HP NetServers with the
NetServer Navigator on CD-ROM.
The cost-effective way to manage
your network.*

When you stop and think about it,
the real cost of your network isn't
the purchase price. It's everything
you pay for afterward.

Precisely why you should consider
an HP NetServer, with its industry-
leading Manageability Suite. By
simplifying server installation,
configuration, support and manage-
ment, HP significantly reduces your
cost of network ownership. Of
course, our new low pricing makes
an HP NetServer a lot less expensive
to own in the first place.

For more information, call us today
at 1-800-533-1333, Ext. 0485 or visit
our web site at [http://www.hp.com/
go/netserver](http://www.hp.com/go/netserver). You'll never look at
the cost of running your network
the same way again.

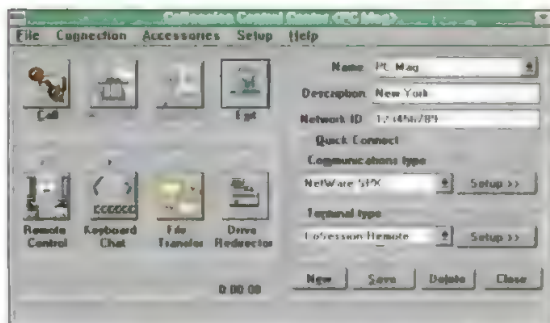


HP NetServers
Manage everywhere, from anywhere.



**HEWLETT
PACKARD**

Remote-Control Software



CoSession for Windows supports simultaneous multiple remote sessions, from both dial-up and networked users.

the worst remote-control performance in this roundup—which the company says will be improved in a new version—making the product less than outstanding.

We did have some difficulty installing CoSession. It would not install on our Pentium system, and though the program makes no changes to display, mouse, or keyboard drivers, we were unable to use the Matrox Ultima video drivers and we had to modify our cloaked mouse driver.

When connecting with CoSession, you can blank the host's screen and lock its keyboard but not disable the mouse. CoSession's file-transfer utility has a use-

SUITABILITY TO TASK
CoSession for Windows

	Power	Ease
Installation and configuration	Fair	Fair
Management and security	Good	Fair
Remote control	Fair	Fair
File transfer	Fair	Fair

ful drag-and-drop operation in a familiar File Manager-like interface. Both features worked properly, but our tests placed CoSession in the middle of the products for file-transfer performance and at the bottom for remote-control performance.

CoSession's security has individual user restrictions at the host drive and directory levels. But if the master password is entered for the host phone book, anyone connected to that host can change the host configuration: user passwords, rights, log-on IDs, and restrictions. A more secure implementation like LapLink's requires reentry of the password to change the host phone book.

While not difficult, redirecting drives using CoSession requires that an additional 37K DOS TSR be loaded on both ends of the connection. DOS users must

also run a special utility to set up drive mappings, while Windows users can manage mappings more easily.

Triton says Version 3.0 of CoSession, scheduled for release later this year, will add Windows 95 features support, Windows-only capability using VxD drivers, and TCP/IP support. These improvements, along with plans for overall faster performance, should make the next version of Co-

Session a more worthy contender.

CoSession for Windows 2.0g. List price: \$99. Triton Technologies Inc., 200 Middlesex Turnpike, Iselin, NJ 08830; 800-322-9440, 908-844-9440; fax, 908-855-9608.

Circle 503 on reader service card

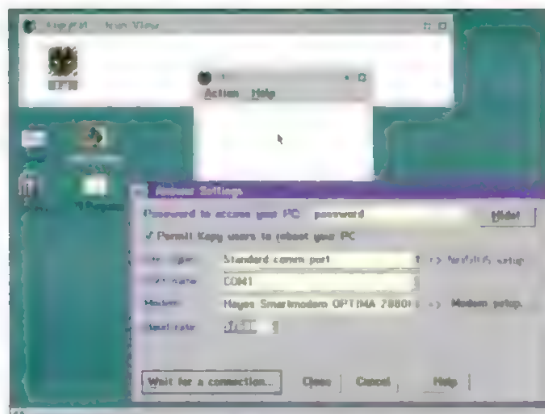
Hilgraeve Software

KopyKat 1.1

BY AMARENDRA SINGH

Hilgraeve has moved the OS/2-based KopyKat 1.1 toward what we expect from a remote-control program, but it still suffers from limited functionality and poor performance. The inclusion of a file-transfer utility as well as support for TCP/IP has made it worth considering for basic remote control for OS/2 users.

The program's two components, Kopy (the client) and Kat (the host), are both included on a single disk. But you need to enter separate serial numbers on the remote and host to operate the product. Otherwise, installation is unremarkable. Changes that are made to your CONFIG.SYS file, namely loading the Kat



KopyKat's security features are limited to password restriction and allowing users to reboot the system.

SUITABILITY TO TASK

KopyKat

	Power	Ease
Installation and configuration	Fair	Fair
Management and security	Poor	Poor
Remote control	Poor	Fair
File transfer	Poor	Poor

video driver, are shown to you with the option to refuse them.

The only thing notable in the host component is its lack of features. Setting up a remote user is simple, but the package's only security features are passwords for initial access and allowing the remote user to reboot. Beyond this, once the connection is made all activity is con-

FILE TRANSFERS



Look for delta-file transfer that passes only changed parts of files and directory synchronization that passes only changed or new files between directories on local and remote machines.

We were disappointed with Remotely Possible/Dial, which lacked background file transfer. We also missed an option in KopyKat that would let users browse directories for files.



trolled by the remote. The lack of additional security features such as file restrictions severely limits use in a corporate environment.

The remote client, Kopy, is also very simple to set up. Since the initial release, Hilgraeve has added a limited file-transfer option. You can send single files or entire subdirectories, but you cannot tag multiple files. Kopy gives you the option of using compression and allows other remote-control activities during transfer.

Consider KopyKat if you need remote control for OS/2 and your needs are limited to the features it provides. But if you need a multituser package, you will probably find it short of the mark.

KopyKat 1.1. Hilgraeve Software, 111 Conant Ave., Monroe, MI 48161; 800-826-2760, 313-243-0576; fax, 313-243-0645; e-mail, custsupt@hilgraeve.com.

Circle 504 on reader service card

Can a multimedia accelerator make you more presentable?



You're on, and it's all up to you. No time for presenting anything but the award-winning Stealth64 Video Series, from Diamond Multimedia. Delivering true multimedia acceleration. With both blazing fast graphics and full-screen, full-motion video that will carry you to the pinnacle of your performance.

Because there's only one way to deliver your ideas - with true visual impact. Starting with 16.7 million colors, photo-realistic images and fast, up to 120Hz, flicker-free refresh rates. Plus if you need professional quality MPEG, or live video input, the Stealth64 Video 3240XL* gives you the option to upgrade to our daughtercard, the Motion Video Player.

Also, the Stealth XL Series comes bundled with CorelDRAW™ CD - the leading graphics application, plus 3D F/X™, a 3D animation software, and Digital Video Producer™, a digital video editing program, from Asymetrix!

Diamond InControl Tools for Windows makes it easy to set up and optimize your performance. Diamond also provides a five-year parts and labor warranty, 24-hour fax-on-demand, and convenient online support services. Giving you the confidence to put your image on the line. Anytime. For more information contact your local dealer or call Diamond at **1-800-4-MULTIMEDIA** today.

Multimedia acceleration without compromise. Would you present it any other way?



Complete Multimedia Desktop Control With InControl Tools Software

VALUE PRICED
Stealth64 Video 3200



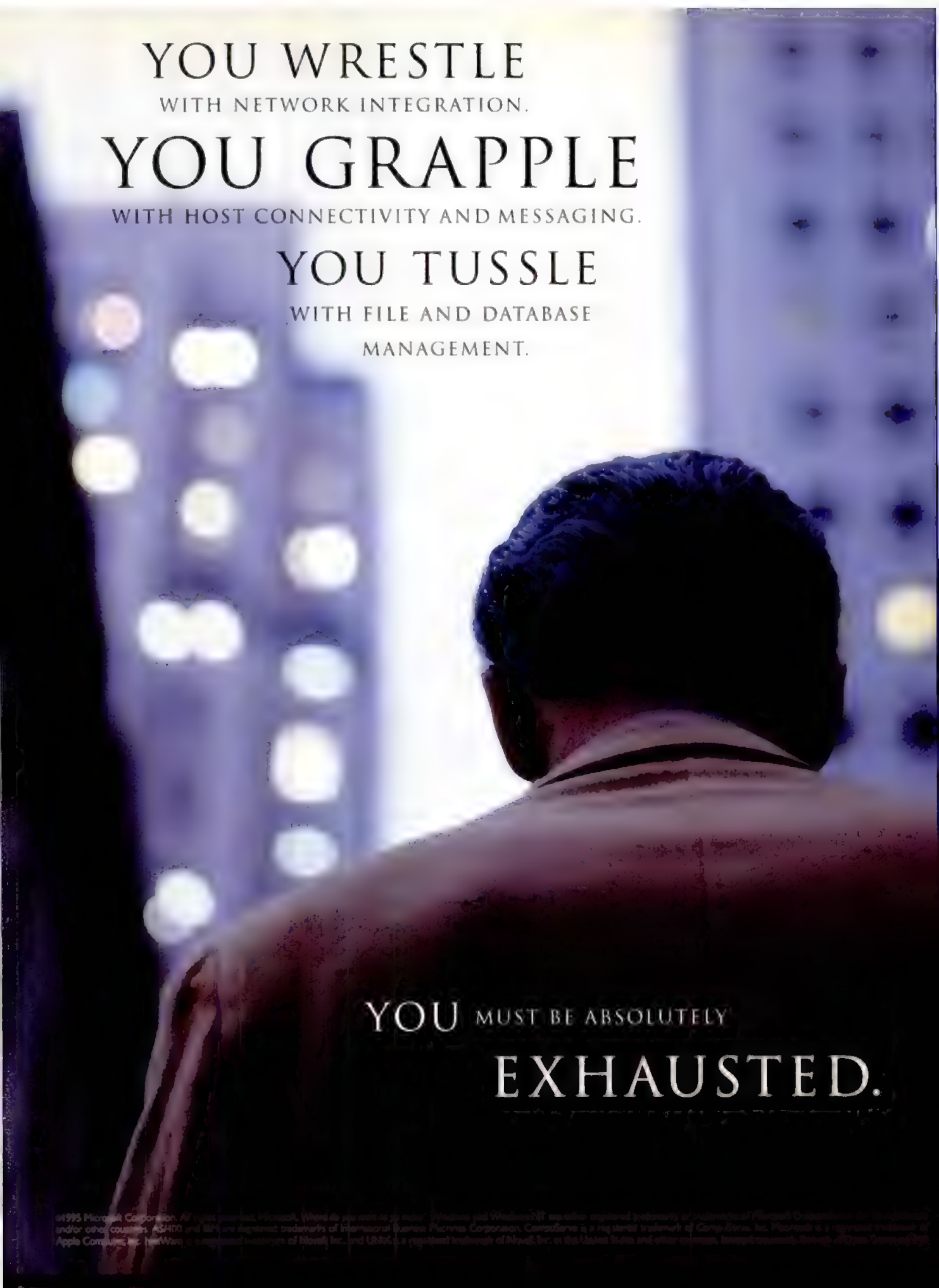
	Stealth64 Video 3240XL	Stealth64 Video 3200	Stealth Video 2120
Controller	S3 Vision968	S3 Vision968	S3 Vision968
Max. Res.	1280 x 1024	1280 x 1024	1280 x 1024
Memory	2MB to 4MB VRAM	2MB VRAM	2MB to 4MB VRAM

*Hardware MPEG acceleration in Stealth64 Video 3240XL. Requires upgrade to 4MB VRAM. Virtual Video™ VBE is supported. And software Drivers included.

24-Hour Fax-On-Demand: 1-800-380-0030 • Internet: www.diamond.com

*The Stealth64 Video 3240XL was formerly named Stealth 64 Vision968. ©1995 Diamond Multimedia Systems, Inc. All rights reserved. All trademarks and registered trademarks are the property of their respective owners.





YOU WRESTLE
WITH NETWORK INTEGRATION.
YOU GRAPPLE

WITH HOST CONNECTIVITY AND MESSAGING.

YOU TUSSLE

WITH FILE AND DATABASE
MANAGEMENT.

YOU MUST BE ABSOLUTELY

EXHAUSTED.

©1995 Microsoft Corporation. All rights reserved. Microsoft, Where do you want to go today?, Windows, and Windows NT are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. AS400 and IBM are registered trademarks of International Business Machines Corporation. CompuServe is a registered trademark of CompuServe, Inc. Macintosh is a registered trademark of Apple Computer, Inc. NetWare is a registered trademark of Novell, Inc., and UNIX is a registered trademark of Novell, Inc., in the United States and other countries. Microsoft, Windows, and Windows NT are registered trademarks of Microsoft Corporation.

Take heart. There's a new, integrated family of server software called Microsoft BackOffice. And it will empower you to do your job. With authority.

Imagine what you could do with an integrated information system.

You could finally break free of clumsy business systems. You could respond more quickly to changing business needs. You could enable the people you work with to get the information they need. So they can make better, smarter decisions.

It's called Microsoft® BackOffice. And it's a whole new approach to business computing. Five best-of-breed products that combine to form an integrated information system. One complete, seamless client-server network based on Windows NT™ architecture that will enable you to create the next generation of information applications. At last.



You start with the network operating system—Windows NT Server. After that, it's easy to add database management (Microsoft SQL Server™), messaging (Microsoft Mail Server), host connectivity (Microsoft SNA Server), and systems management (Microsoft Systems Management Server). You can forget struggling for days to get things up and running, because everything is optimized to work with Windows NT Server, and everything is designed to work together.

You can forget struggling with a jumble of tools and incompatible interfaces, too.

With Windows® architecture on both the client and the server, you'll use a consistent, graphical set of tools to develop and manage applications across all products. And easily tie corporate information to the desktop.

Now about money. And choice. Explain to your boss that an open platform means the power to extend your existing network, including NetWare®, Macintosh® and UNIX®. Mention that it runs on standard, leading hardware, which lowers the cost of purchase and operation. And that there are over one thousand 32-bit applications for the Windows operating system and tens of thousands of 16-bit Windows-based applications at your disposal. Which makes the BackOffice family a sound investment.

Call (800) 709-3783, Dept. HJM to learn more. Or contact us at "GO BIZSOLN" on CompuServe®. You can revolutionize the way people in your company use and share information. You can make the decisions that make your business run better. It's all within your reach.

Microsoft Windows NT Server: The network foundation for a new generation of business applications. It is a multipurpose network operating system that can deliver application server capabilities without compromising file and print service performance.

Microsoft SQL Server: The high-end database platform at the center of a complete client-server architecture for information management.

Microsoft SNA Server: Makes it easy to connect PCs to IBM mainframes and AS/400s.

Microsoft Mail Server: The heart of a complete messaging system that makes it easy to communicate with anyone, anywhere.

Microsoft Systems Management Server: The most comprehensive solution for managing networked PCs.

Client License Pak: BackOffice family licensing simplifies client-server pricing. The client license pak includes one Client Access License for each BackOffice server product you acquire, essentially licensing a single desktop to access those products on any server.

Microsoft®

WHERE DO YOU WANT TO GO TODAY?™

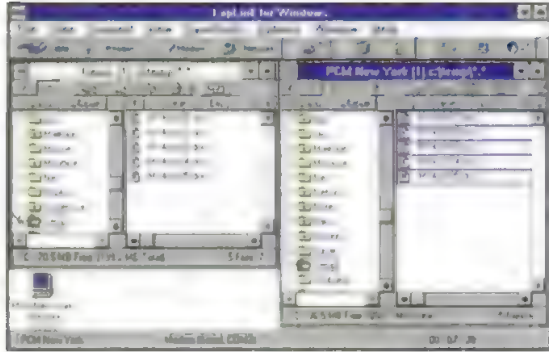
Remote-Control Software

Traveling Software Inc.

LapLink for Windows 6.0a

BY GARRY FRENKEL

Building on its file-transfer and synchronization fortes, LapLink for Windows 6.0a delivers good remote-control features and performance. But its security is not as sophisticated as other products we looked at, and



LapLink supports multiple simultaneous dial-up, serial and parallel, NetWare, and wireless connections.

overall performance was good but not outstanding.

During installation, LapLink modifies the WIN.INI and SYSTEM.INI files and replaces the default display driver with its own; it also copies the originals, in case

you decide to use the uninstall program. LapLink does an excellent job of displaying host screens with higher resolution than the remote system's screens by using either slider bars to scroll through the screen or a shrink-to-fit option. In addition, remote-control performance was very good: LapLink had the best timing on our Windows Remote Control test. Full-screen or non-Windows DOS operation requires loading LapLink's DOS TSRs.

Security and management are adequate for a single user, but not exceptional. The host system is defined as public (open to anyone), private (open to no one), or open only to predefined users. The program keeps audit logs, but not by individual users, and it does not report total connect time. You can specify by user whether to allow file transfers and disable the host's screen, keyboard, or mouse. But guests cannot be restricted by file or directory.

Given LapLink's history, it's no surprise that the package has good file-transfer features: SmartXchange synchronizes directories, and SpeedSync com-

SUITABILITY TO TASK		
LapLink for Windows		
	Power	Ease
Installation and configuration	Good	Good
Management and security	Fair	Good
Remote control	Good	Excellent
File transfer	Good	Excellent

pares files and transfers only the changed portions. ReachOut is the only other product in the roundup that uses this delta-transfer technique. Despite these features, LapLink's file-transfer performance was average.

LapLink supports dial-up, serial and parallel, NetWare, and wireless connections, and can support multiple simultaneous connections, which is especially helpful for remote technical support. But unlike many products in this roundup, LapLink offers neither drive redirection nor printer redirection, which means that printing can take place only on your local machine.

LapLink for Windows 6.0a. List price: With cable, \$199.95. Traveling Software Inc., 18702 North Creek Pkwy., Bothell, WA 98011; 800-343-1408, 206-483-8088; fax, 206-485-6786; e-mail, sales@travsoft.com.

Circle 505 on reader service card

And Now for the Megairon

By O. Ryan Tabibian

Are you looking for a single remote-access server that offers virtually every type of remote access? Consider an industrial-strength communication server. Such products are highly manageable and offer remote control, remote node, and remote control over remote node.

Instead of stacking desktop PCs, communication servers (also called *remote-control servers*) house several PC boards in one manageable and often fault-tolerant enclosure. This way, products such as the J&L Chatbox can, for example, automatically reset a hung PC board—something no desktop PC can offer.

In terms of software, the PCs in the communication server run the same applications that run on any desktop.

Most of these servers ship with one of the remote-control packages reviewed here. And most will run NetWare Connect, so one box can offer native remote control, remote node, and remote control over remote node. (See our sidebar "The NLM Option: NetWare Connect and WanderLink" in the companion story, "Remote Node: Hello LAN.")

In contrast, the remote-node servers reviewed in this article allow you to control only a networked PC outside the server. There are no internal processors for users to control.

The communication-server market is mainly led by Cubix and J&L. Cubix's strength lies in its products' fault tolerance and scalability, while J&L offers a broader product line.

Not far behind the products offered

by those vendors is the easy-to-manage Evergreen CAPServer—the communication server that has the tightest integration with NetWare and NetWare Connect.

For those searching for a low-cost communication server, consider the WinView, from Citrix Software, or Symantec Corp.'s pcAnywhere Access Server. The WinView and the pcAnywhere Access Server are OS/2 servers that create multiple virtual PCs on a single machine. The downfalls of these products can be compatibility and performance. Because the servers emulate multiple Windows sessions, you should make sure your applications will be mutually compatible. Also, if you have more than a couple of users, make sure the server is a high-end Pentium PC with a lot of memory. □

Free Evaluation Kit
NOW AVAILABLE
Call 1-800-522-7822

REACHOUT 5.0 GUARANTEES A NEW LEVEL OF RAPID TRANSIT. SORRY, pcANYWHERE.



TOTAL ACCESS, TOTAL SPEED

Quick! Grab on to the industry's only complete remote access solution. It's ReachOut® 5.0. And it's leaving others in the dust. + ReachOut 5.0 offers you remote control, remote file transfer and remote node optimization. No more limited choices or sluggish operation. It's complete remote access in the fast lane, or your money back. From the company whose products help you manage, access and protect your information assets. So speed over to your favorite reseller, contact www.stac.com or call 1-800-522-7822 ext. 0621.

Stac

Outside of the U.S. call 1-619-794-4333 or fax 1-619-794-4575 for more information.
© 1995, Stac. Stac and ReachOut are registered trademarks of Stac. Please contact Stac for details regarding product guarantees.



CIRCLE 061 ON READER SERVICE CARD

Remote-Control Software

Symantec Corp.

The Norton pcAnywhere 2.0 for Windows

BY STEVE RIGNEY



Rare among this group, Symantec's \$129 Norton pcAnywhere 2.0 for Windows does not replace any of your Windows drivers, change any of the settings in your INI files, or require TSRs. pcAnywhere is also extremely easy to set up, works across both dial-up and network connections, and is one of the first products in this roundup to take advantage of the modem drivers in Microsoft Windows 95.

We were impressed with pcAnywhere's features that went beyond remote control. pcAnywhere includes a file-synchronization utility, drive mapping, a terminal emulator with a script to dial CompuServe, and a useful chat feature. In our testing, we found that

pcAnywhere was a more stable product than ReachOut and came close to matching ReachOut's performance. In fact, pcAnywhere had the fastest timing among reviewed products when transferring our highly compressible file; on the Windows Remote Control test, pcAnywhere was actually faster than ReachOut.

The product has drive redirection but only maps the drives of the remote machine to the host (ReachOut will map in both directions). Like LapLink, pcAnywhere allows you to connect two PCs via a parallel or serial cable or over a LAN.

Installation couldn't be easier. Within 15 minutes of opening the box, we

had installed pcAnywhere and established a network and dial-up remote-control session with the host PC. Remote-control performance was fairly

good over dial-up but merely acceptable across the network.

Although not quite as powerful as ReachOut, pcAnywhere provides enough security features to make administrators



pcAnywhere's very useful pop-up online menu lets you quickly launch a file transfer or start a chat with the host. When you end a session, you can choose not to allow any further calls or to keep pcAnywhere active (if you've been given that right on the host PC).

SUITABILITY TO TASK		
The Norton pcAnywhere for Windows		
	Power	Ease
Installation and configuration	Good	Excellent
Management and security	Good	Good
Remote control	Excellent	Excellent
File transfer	Good	Excellent

comfortable. You can configure pcAnywhere with user names, case-sensitive passwords, callback, and data encryption. You can lock the host PC's keyboard and screen, and keep a log of all failed entry attempts. An extensive management log monitors connection times, user access, failed log-ons, and failed connections.

Besides dialing into a pcAnywhere host, you can use it as a dial-out gateway and configure a single PC running pcAnywhere as both a dial-in and dial-out

Modem Central: A Remote-Control Alternative

By Anatoliy Nosovitskiy

Remote-control products are fine for a few users. But can you afford the cost, management, and security of equipping each of your users' PCs with a data line and modem? Instead of an expensive communication server, consider running a remote-control session over a remote-node link.

Naturally, in running both remote control and remote node there's extra overhead. We compared remote-control and file-transfer performance over an analog phone line of the leading remote-control product, The Nor-

ton pcAnywhere 2.0 for Windows, with two different solutions.

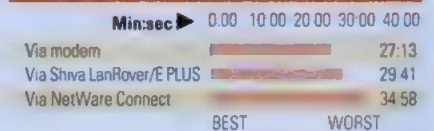
We ran pcAnywhere over NetWare Connect 1.0. pcAnywhere uses NetWare Connect's modem-pooling protocol (NASI) to link to modems on the LAN; it then runs remote control over the LAN to a host PC. We also ran pcAnywhere over Shiva's LanRover/E PLUS 3.5, which routes a network connection to the remote PC.

For remote control over both NetWare Connect and the LanRover/E, performance was acceptable—only 10 to 30 percent slower than running over

phone lines alone. But file-transfer performance was about the same as with a native remote-node connection.

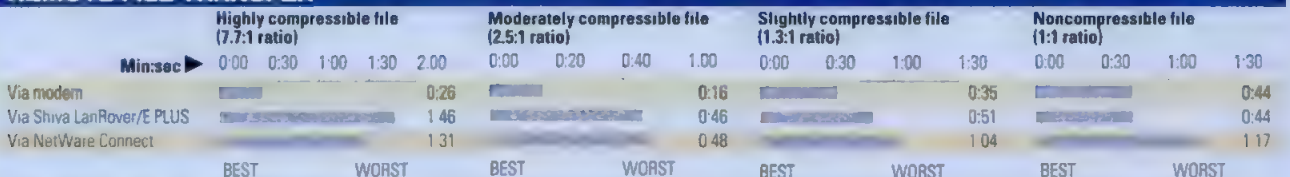
Tighter security, better manageability, lower cost, and access to your own desktop at the expense of a small performance hit: Remote control over remote node certainly offers a lot for the user and the network manager. □

WINDOWS REMOTE CONTROL



Note: We conducted all tests using The Norton pcAnywhere for Windows

REMOTE FILE TRANSFER



Note: We conducted all tests using The Norton pcAnywhere for Windows

COREL DRAW!

*The Award Winning
Graphics and Publishing Team!*



Ideal Entry-Level Graphics

CorelDRAW 3 is so easy to use! With precision type control, amazing special effects and powerful illustration tools, CorelDRAW 3 is the ideal entry-level graphics package. CorelDRAW 3 includes CorelCHART, Corel PHOTO-PAINT, CorelSHOW, CorelTRACE and Corel MOSAIC.

- 250 fonts
- 14,000 Clipart Images & Symbols

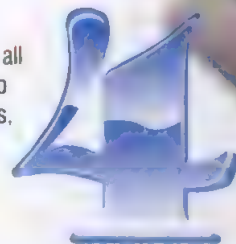


\$65*
CD-ROM VERSION

Powerhouse Graphics

CorelDRAW 4 is the complete graphics solution. With all the power and modules of CorelDRAW 3, CorelDRAW 4 also includes dozens of new artistic and technical enhancements, an object-oriented animation module, OCR capabilities and multi-page layout.

- 750 fonts
- 18,000 Clipart Images & Symbols



\$129*
CD-ROM VERSION

Complete Graphics & Publishing Solution

CorelDRAW 5 combines the graphics power of CorelDRAW and the advanced publishing capabilities of Corel VENTURA 5 within an integrated user interface. CorelDRAW 5 has all the modules of CorelDRAW 4 plus a revolutionary color management system, major gains in speed and performance, and hundreds of improvements.

- 825 fonts
- 22,000 Clipart Images & Symbols



\$449*
CD-ROM VERSION



We ship **FedEx** standard overnight shipping
1-800-495-6216
Call 24 hours a day.
Or order over the Internet.
© 1997 Corel Corporation

*US\$ plus applicable taxes and shipping



Call now for faxed literature!
1-613-728-0826 ext. 3080
Document #1071

Performance Tests: Remote-Control Software

The best overall performer was ReachOut 5.0 for Windows, followed closely by The Norton pcAnywhere 2.0 for Windows. Both offer efficient file-transfer protocols and compression, with effective screen refresh and caching. Carbon Copy for Windows 2.5b fared well on file transfer, but was in the lower tier on the remote-control test.

What the Numbers Mean

Carbon Copy, pcAnywhere, and ReachOut were head and shoulders above the competition on our Remote File Transfer tests. ReachOut in particular excelled, delivering our highly compressible file in less than 30 seconds and the moderately compressible file in 16 seconds; this contrasts with PolyPM/2 3.0, which took more than 3 minutes and 2 minutes, respectively. But the reviewed

products showed minimal performance differences on our slightly compressible and noncompressible file-transfer tests.

Each package uses a proprietary communications protocol that breaks down data files for transmission and implements error checking to ensure that the data is received intact. The efficacy of each package's protocol, along with its compression technique, has the greatest impact on performance. Each product offers a proprietary

compression scheme except Remotely Possible/Dial, which relies on a V.42bis modem's less capable scheme. If you're transferring noncompressible files (such as PKZip files), you'll see comparable performance among these products. The exception is PolyPM/2, which operates at a serial port speed of only 19.2 Kbps. Although these products support varying maximum DTE rates, additional testing with ReachOut and pcAnywhere revealed performance differences only when transferring files at rates less than 38.4 Kbps.

Beyond the bottleneck of a slow modem, the quality of video support and caching determines the responsiveness of an application running remotely. LapLink for Windows 6.0a, pcAnywhere, and ReachOut succeed in these areas. LapLink was the top performer on our Windows Remote Control test,

REMOTE FILE TRANSFER



The DTE rate (in kilobits per second) at which we tested each product appears in parentheses after the product.

host. Symantec sells pcAnywhere Access Server, Version 1.0, OS/2-based server software that supports up to 10 concurrent users. Dial out across any network using the IPX, TCP/IP, and NetBEUI protocols.

pcAnywhere is much more than a dial-up remote-control package. With features such as file transfer, network access, dial-out, on-line service scripts, and terminal emulation, pcAnywhere could be the only communications package you will need on both your desktop and notebook PCs.

The Norton pcAnywhere 2.0 for Windows. List price: \$129. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 800-441-7234, 408-253-9600; fax, 408-253-3968; Web, <http://www.symantec.com/>. Circle 506 on reader service card

Software Corp. of America

PolyPM/2 3.0

BY AMARENDRA SINGH

With ease of use and features that OS/2 users are unaccustomed to, this release of PolyPM/2 might have provided a no-comparison alternative to any DOS and Windows remote-control packages. But PolyPM/2's file-transfer performance was the worst of all the products reviewed;

OS/2 users might be better served with another package running in a Windows shell.

Like other remote-control software, PolyPM/2 comes as two separate modules:

Teacher, the remote module, and Pupil, the host. In addition to OS/2 machines, PolyPM/2 can also control DOS and Windows sessions using the included Pupils for those environments. The DOS Pupil is limited to character-based sessions.

PolyPM/2 supports a variety of connection methods, including asynchronous, direct, NetBIOS, IPX,

TCP/IP, X.25, and APPC/APPN, but the list of supported modems was smaller than many other packages. PolyPM/2 provides a powerful

scripting language that can automate many tasks for easy connections.

One security feature on the host end makes PolyPM/2 more secure than most

SUITABILITY TO TASK

PolyPM/2

	Power	Ease
Installation and configuration	Fair	Fair
Management and security	Fair	Fair
Remote control	Fair	Good
File transfer	Poor	Good

completing the routine in just over 26 minutes. This timing is nearly half that of CoSession for Windows 2.0g, which took almost 50 minutes.

Caching algorithms increase performance by storing recently used data and redrawing the screen from a temporary storage area. All of the products in this roundup offer some form of caching. The more effective packages are able to store full pages in cache and grab the data out faster.—*Analysis written by Jeffrey G. Witt*

How We Tested

Our test-bed consisted of two identical desktop machines configured with either Microsoft Windows for Workgroups 3.11 or OS/2 Warp. Each system was connected through a Hayes Optima 288 V.34 modem via the nonimpaired phone lines provided by AT&T's Definity switch. We set each package to its highest supported data-transfer rate

and initialized each modem with the string provided by the software. For both tests, we report the timings of the transfers in minutes and seconds.

For our **Remote File Transfer** test, we transfer four different file types to stress the products' compression algorithms and their ability to move data as fast as possible. (For details on test files, see "Performance Tests: Remote-Node Servers.")

For our **Windows Remote Control** test, we built a test script to evaluate each package's ability to run Microsoft Windows-based applications. The script consists of seven cycles. Within each cycle the script runs eight Windows applications: all Microsoft Office applications and Help as well as the Notepad, Clock, and Calculator. Applications run in the same order for each cycle and open different data files through each run, including documents, bitmaps, and spreadsheets. As the script loads each application, it switches screens twice between the application and Program Manager. For a fair comparison, the OS/2-based products were not included in this testing.

Noncompressible file (1:1 ratio)



N/A—Not applicable. The product does not run under Windows.

WINDOWS REMOTE CONTROL



packages we reviewed: When you create a Teacher, you must enter the product license number, and callers cannot connect unless they are using that number. File-

level security is not quite as easy or powerful to implement because you are limited to a maximum of 80 files, and you must define the rights to each file individually.

The file-transfer module is simple to use, and while it does not support features such as drive mapping, it is powerful enough to satisfy most users' needs. You can transfer single files, subdirectories, or multiple files based on criteria such as file attributes, size, or dates.

For OS/2 users inured to subpar packages, PolyPM/2 has excellent usability features but is very slow. Parts of this program could be made more intuitive, and features such as roving call-back and directory-level security

should be added. PolyPM/2 is reliable but may be too sluggish for some.

PolyPM/2 3.0. List price: \$293. Software Corp. of America, 100 Prospect St., Stamford, CT 06901; 800-966-7722, 203-359-2773; fax, 203-359-3198; e-mail, pzullo@talkthru.com.

Circle 507 reader service card

Stac Electronics

ReachOut 5.0 for Windows & DOS

BY STEVE RIGNEY



Ideal for any user, ReachOut for Windows & DOS, Version 5.0, includes high-speed performance, powerful security, file synchronization, and virus protection. And at \$99, it's also one of the lowest-priced products in this roundup.

ReachOut—acquired along with its owner, Ocean Isle, last year by Stac—is easy to install and doesn't replace any Windows drivers or require any TSRs. The package works over a LAN or via a

INSTALLATION



pcAnywhere was a breeze to install. It didn't replace any drivers or use TSRs. Close-Up's installation report is a nice feature that tells you all the changes made to your system.

But in general, we were not happy with Close-Up's boot process. Since this remains essentially a DOS-based product, we had to load a TSR before starting Windows.



remote asynchronous, ISDN, or cellular dial-up connection.

ReachOut's file synchronization was one of the best in this roundup. ReachOut Smart Transfer uses delta-file transfer technology; LapLink is the only other product we saw with a similar feature. Rapid Sync compares entire subdirectories or drives and transfers only new or missing files.

ReachOut also excels with security. Beyond the basics, ReachOut provides password aging, time-limited connection times, individual audit logs, and the ability to create your own data-encryption



PolyPM/2's ease-of-use features include configuration options in familiar Presentation Manager tabbed folders.

SUMMARY OF FEATURES

Remote-Control Software

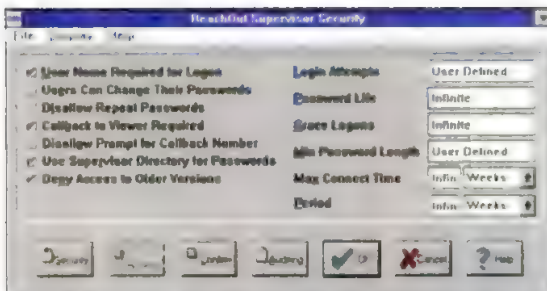


■ YES □ NO

Products listed in alphabetical order

	Carbon Copy for Windows 2.5b	Close-Up 6.0	CoSession for Windows 2.6g	KopyKat 1.1	LapLink for Windows 6.0a	The Norton pcAnywhere 2.0 for Windows	PolyPM/2 3.0
List price	\$199.00	\$199.00	\$99.00	\$199.00	\$199.95	\$129.00	\$295.00
Operating systems supported (remote client)	DOS	DOS, Windows	Windows	OS/2	Windows	DOS, Windows	OS/2
Setup and Configuration							
TSR memory requirements	92K (DOS only)	42K-75K	35K-74K (DOS only)	1K	72K (DOS only)	60K (DOS only)	35K
User can remove TSRs without rebooting	■	■	■	■	■	■	■
Replaced Windows drivers	Mouse, video*	None	Communications	None	None	None	None
Can install remotely over the LAN	■	■	■	■	■	■	■
Auto-detects modems/COM-port conflicts	■	■	■	■	■	■	■
Maximum screen resolution supported	1,280 x 1,024	800 x 600	1,280 x 1,024	1,024 x 768	1,280 x 1,024	2,048 x 1,280	1,024 x 1,024
Management and Security							
Warm/cold reboot of host on disconnect	■	■	■	■	■	■	■
Session log/individual audit logs	■	■	■	■	■	■	■
Built-in virus protection	■	■	■	■	■	■	■
Statistics reporting by port	■	■	■	■	■	■	■
User can set time limit on session	■	■	■	■	■	■	■
Host/remote memory management	■	■	■	■	■	■	■
Encrypted passwords/data	■	■	■	■	■	■	■
User can restrict access by file/directory/drive	■	■	■	■	■	■	■
Remote Control							
Chat mode/Remote clipboard	■	■	■	■	■	■	■
Simultaneous remote control, chat, and file transfer	■	■	■	■	■	■	■
Call-back/Roving call-back	■	■	■	■	■	■	■
Scripting/Hotkeys/Macros	■	■	■	■	■	■	■
Prints at remote and host	■	■	■	■	■	■	■
Drive redirection (mapping)	■	■	■	■	■	■	■
Host can view remote screen	■	■	■	■	■	■	■
File Transfer							
Delete/copy/rename files	■	■	■	■	■	■	■
Background transfer	■	■	■	■	■	■	■
Synchronizes files/directories/drives	■	■	■	■	■	■	■
Delta file transfer/Restartable file transfer	■	■	■	■	■	■	■

* Replacing sound and keyboard drivers is optional



ReachOut's powerful security includes options to limit log-on attempts, passwords, and connection time by user.

keys. ReachOut also provides a virus scanner that automatically scans for infected files when you copy from the host PC.

The file-transfer performance of ReachOut was excellent. The reason: Stac's LZS compression algorithm.

We found some bugs: Our systems

hung up when we tried to exit Windows, and ReachOut had trouble transferring large fonts. Stac apparently fixed the problems during our testing.

Stac offers a coupon for Shiva's PPP remote-node client with ReachOut, but the software is not as integrated into ReachOut as it is with Farallon's Timbuktu (see the sidebar "Timbuktu Pro for Windows").

With excellent usability, performance, and security, ReachOut ranks among the best remote-control programs we've seen.

ReachOut 5.0 for Windows & DOS. List price: \$99. Stac Electronics, 12636 High Bluff Dr., San Diego, CA 92130; 800-677-6232, 619-794-4300; fax, 619-194-4570.

Circle 508 on reader service card

SUITABILITY TO TASK

ReachOut for Windows & DOS

	Power	Ease
Installation and configuration	Good	Good
Management and security	Excellent	Excellent
Remote control	Excellent	Good
File transfer	Excellent	Excellent

Avalan Technology Inc.

Remotely Possible/Dial 4.0

BY GARRY FRENKEL

With a somewhat limited feature set and substandard performance, Remotely Possible/Dial 4.0 is an un compelling choice among the products we reviewed, especially at its list price of \$199.

During its straightforward, single-disk installation process, Remotely Possible creates icons for the separate Host pro-

DELL LATITUDE
Dependable Notebooks
With Superior Battery Life



DELL LATITUDE™ LX 41000
100MHz INTEL®DX4™

- 10.4" Dual Scan Color Display
- 4MB RAM (20MB Max RAM)
- 128KB L2 Cache
- 420MB Upgradeable Hard Drive (810MB Max)
- \$99 More for 2nd NiMH Battery (Slides into floppy drive to achieve extended battery life)

- 32-bit Local-bus Video, 1MB Video RAM
 - 2 Type II/1 Type III PCMCIA
 - Preloaded Communications Software
 - 6.2 Pounds
 - ★ 1 Year Warranty¹
 - 30 Day Money-back Guarantee²
 - *Double your RAM for only \$200 more*
- Business Lease³: \$74/Mo.
Order Code #800020

Our New
100MHz Latitude LX

\$1999

FITS IN SMALL BUDGETS AS WELL AS SMALL BRIEFCASES.



With the versatile Dell Latitude LX, you can put \$3500 worth of notebook in your briefcase, but pay only \$1999.

You've always wanted a 10.4" STN **NEW 10.4" DISPLAY** color display, a speedy 100MHz processor, and L2 cache right there on the motherboard. Now you've got it all.

The Dell Latitude LX notebook's floppy drive bay accepts a second battery for double the battery life. And our notebook is covered by a guaranteed* 1 year next-business-day, at-your-desk service contract⁴.

So, if you don't get the Dell Latitude LX now, you better have something examined. And we don't mean your briefcase.

DELL

TO ORDER, CALL

800-765-4458

In Canada,* call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT

Sun 12pm-5pm CT • <http://www.us.dell.com/>

Keycode #04077



Promotional pricing on featured system is not discountable. *Guarantees available in the U.S. only for registered owners of Dell Latitude systems purchased after 8/8/94. ¹For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., 2214 W. Braker Lane, Building 3, Austin, TX 78758. ²On-site service provided by BancTec Service Corp. On-site service may not be available in certain remote locations. ³Business leasing arranged by Leasing Group, Inc. *Prices and specifications valid in the U.S. only and subject to change without notice. The Intel Inside logo is a registered trademark and IntelDX4 is a trademark of Intel Corporation. ©1995 Dell Computer Corporation. All rights reserved.

Remote-Control Software

mouse button. Slider bars or a shrink-to-fit option would be welcome additions.

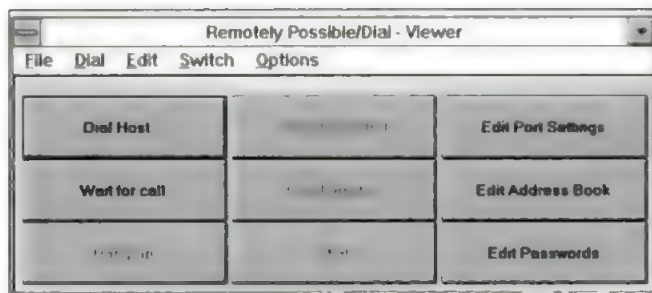
An address book lists frequently called numbers and passwords and access rights of authorized users. Like some other products in this roundup, it has no advanced file or directory restriction. And you specify whether to disable the host's screen, keyboard, or mouse only from the remote Viewer, not at the Host.

The file-transfer facility needs work. You can't see the sizes or dates of the displayed files or perform any file or subdirectory management on the Host. Files are added to the transfer queue by selecting an individual file or by selecting all the files for a given subdirectory; also, file

transfers cannot occur at the same time as a remote-control or chat session.

Remotely Possible's interface doesn't offer many of the features, such as toolbars and drag-and-drop, that users expect from Windows applications. Like the product as a whole, it works but has no exceptional qualities. □

Remotely Possible/Dial 4.0. List price: \$199. Avalan Technology Inc., P.O. Box



Remotely Possible/Dial's plain interface doesn't offer such useful Windows features as toolbars and drag-and-drop.

6888, Holliston MA 01746; 800-441-2281, 508-429-6482; fax, 508-429-3179; e-mail, 76206.3602@compuserve.com. Circle 509 on reader service card

Timbuktu Pro for Windows

By Steve Rigney

If you're looking to use remote control for training, customer support, or document collaboration, consider Farallon Computing's Timbuktu Pro for Windows. This \$199 package is the first networked remote-control package to integrate the installation and configuration of Shiva's remote-node client; it provides file transfer, remote control, and mail between PCs and Macintoshes across TCP/IP, IPX, and NetBEUI networks.

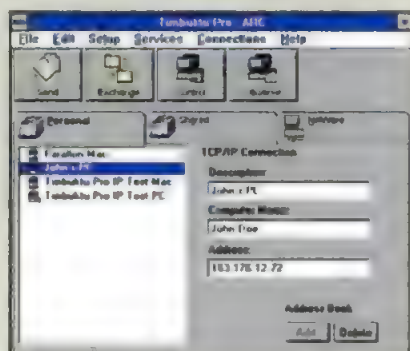
Though other remote-control packages—such as Carbon Copy, The Norton pcAnywhere, and ReachOut—run over networks (and in the case of ReachOut also ship with Shiva's client), none can match Timbuktu's slick interface, cross-platform support, or simple mail facility.

Timbuktu's interface is based around a large toolbar that lets you choose among four basic functions: controlling, exchanging files with, observing, and sending messages to a remote PC or Macintosh. Observing is a great feature for network training and troubleshooting. A feature that lets you send messages and file attachments, called FlashNotes, is also quite handy; it's like a robust, Windows version of the NetWare client's SEND command.

Note, however, that unlike Lap-

Link, pcAnywhere, or ReachOut, Timbuktu does not provide any file synchronization. Furthermore, Timbuktu does not offer remote control over native phone lines.

You select a particular networked



Timbuktu creates Personal and Shared folders of all the PCs you need to connect to.

PC from a tabbed address book. There are three tabs to choose from: Personal, Shared, and NetWare. *Personal* stores the addresses of commonly connected stations. *Shared* are common addresses that everyone uses. *NetWare* lists all available NetWare stations to which you can connect.

Connecting to a station via dial-up requires some work, but far less than with ReachOut. A menu item drops you into the Shiva software, which (after you type in your username, password, and phone number) makes a

connection. Still, Timbuktu isn't quite as easy in this regard as Microcom's LANexpress 4000, which provides a single menu for establishing a remote-node and remote-control connection to the network.

We found a problem with Timbuktu in our tests when we tried to establish a network connection between two PCs running Windows for Workgroups. Timbuktu does not work with Microsoft's NWLink IPX-compatible protocol, and we had to switch to Novell's IPXODI driver. Though not a problem for an administrator, this could be confusing for the average user.

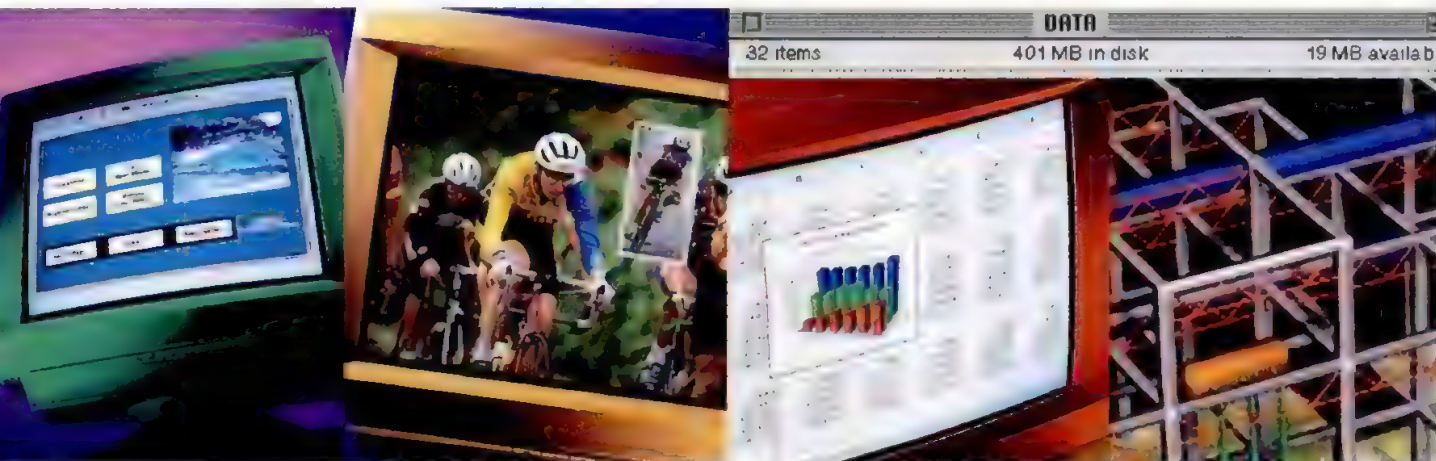
Timbuktu's security is tight and is invoked as soon as you're connected. At a minimum, this means typing in a password. You can limit users to Observer-only access, and Timbuktu also offers data encryption.

Though we would like to see tighter remote-node integration, Timbuktu is certainly an impressive product. Its simple user interface and its ability to search the network for available PCs makes Timbuktu easy for both the administrator and the end user. □

Timbuktu Pro for Windows. List price: \$199. Farallon Computing Inc., 2470 Mariner Square Loop, Alameda, CA 94501; 510-814-5100; fax, 510-814-5020.

Circle 540 on reader service card

Is your software leading you toward a gigabyte?



(It's time to talk to Seagate, the gigabyte leader.)

Seagate is the market share leader in 1 GB disc drives, and has been since 1989. Because we offer something most drive companies don't. Choice. Seagate has the drives you need to satisfy the widest variety of applications.

If yours is a desktop system, Seagate's Medalist 1080 is your drive. Medalist features the Fast ATA-2 interface to give you both the value and performance you demand. Fast ATA-2 drives are up to 400% faster than old IDE drives, yet are 100% IDE-compatible.



The Hawk 2LP is the drive for you if you're looking at a high-end desktop, workstation, array or server. With ASA II architecture, Hawk drives significantly reduce controller overhead, so you get better throughput performance and 100% SCSI compatibility.



Both drive families offer the high quality and reliability you'd expect from the industry leader. So when you need gigabyte solutions, the best decision you can make is to call Seagate at 408-438-8111, or see our home page at <http://www.seagate.com>.



Seagate
THE DATA TECHNOLOGY COMPANY

Seagate and the Seagate logo are registered trademarks and Medalist and Hawk are trademarks of Seagate Technology, Inc. © 1995 Seagate Technology, Inc.

CIRCLE 271 ON READER SERVICE CARD

THE ART OF BEING REMOTE REMOTE NODE: HELLO, LAN

Welcome to the future of remote computing. Simpler than remote-control solutions, these 13 remote-node servers let you attach to a LAN anywhere there's a phone line.

By Frank J. Derfler, Jr.

Imagine two conveyor belts: one that's remote-control, one that's remote-node. *Remote control* moves finished products—screens and keystrokes. *Remote node*, by contrast, moves the raw materials—which in this case are network packets. Just as on a conveyor belt, you must move a lot more of the raw materials to get things done. But moving the raw materials, or network packets, is a harder process, less susceptible to damage than moving entire finished screens.

We believe that the future of remote access is in remote-node connections. Client/server applications, graphics applications, and high-speed connection technologies such as V.34 modems and ISDN all favor remote node. The upcoming Microsoft Windows 95 will also include remote-node clients compatible with many of the servers reviewed here.

In a remote-node system, the phone line just becomes another extension of your LAN. The calling PC sees the network resources as more disk drives and printers; in other words, you work normally—as if you were sitting on the LAN. In contrast, using a remote-control system means rewiring your mind to think about doing work on a distant ma-

chine whose work stays on that machine.

We found many dimensions to the 13 remote-node products we reviewed.

Some, like Shiva Corp.'s LanRover/E PLUS 3.5 and 3Com Corp.'s AccessBuilder 2000, are complete hardware-and-software packages that install in a snap.

In contrast to the hardware approach, remote-node client software is part of IBM's OS/2 Warp Connect and Windows 95. Windows NT comes with remote-node client and host software so your Windows NT file server can be an access server; however, you'll want to set up a dedicated system for more than casual use.

Other products, like IBM's LAN Distance Connection Server and Stampede Technologies' Remote Office Communications Server, are essentially kits that you add to a PC. The Stampede kit is

much easier to install than the IBM kit.

Increasingly, remote-node products include remote-control capabilities. They make a remote-node connection to the LAN and then allow you to control a PC on the LAN remotely. This works well for applications with special hardware requirements for network diagnostics or for applications that don't take advantage of client/server technology to reduce the amount of data flowing through the modem. (For a look at running remote-control software over a remote-node connection, see the sidebar "Modem Central: A Remote-Control Alternative" in the remote-control article in this issue.)

Regardless of a product's configuration, three factors are critical: ease of installation, ease of management, and security. It's tough and expensive to support mobile users, so these products need to be easy to use. Each product review has a Suitability to Task box that rates these.

The installation and support architectures of these products mirror the backgrounds of the companies. Attachmate Corp., Cisco Systems, and IBM seem to think that highly skilled and trained professionals will install and maintain their products. Shiva, Stampede, and 3Com try to make things as simple as possible. Shiva's LanRover/E PLUS was our Editors' Choice, while Stampede's Remote Office offered the lowest-priced solution with high scores on our performance tests.

REVIEW CRITERIA

We set some practical criteria for a product to be included in this roundup. We asked for four-port servers that work with Windows or OS/2 clients and that simultaneously handle the IPX and IP protocols. We asked that the serial ports operate at 115.2 Kbps so they can support modern 28.8-Kbps V.34 modems. Our research pulled in 13 products.

IN THIS REVIEW

Products reviewed:	
Attachmate RLN	
Turnkey Server.....	303
Cayman Gator Access MP.....	304
Cisco 2509 Access Server.....	308
IBM LAN Distance	
Connection Server.....	308
LAN Access LANA/4e.....	310
Microcom LANexpress 4000.....	315
Multi-Tech MiniArray Turn-Key Communications Server MASTER HD.....	316
RAD MBE-RAS.....	316
Shiva LanRover/E PLUS 3.5.....	318
Stampede Remote Office	
Communications Server.....	318
Telebit NetBlazer PN4DE.....	321
3Com AccessBuilder 2000.....	323
Xylogics Remote Annex 2000.....	325

Remote-Node Servers

research pulled in 13 products.

Our criteria cut out some products. Novell's NetWare Connect dropped because a new version will be out this summer, but you'll find it reviewed along with Funk Software's WanderLink in the sidebar "The NLM Options: NetWare Connect and WanderLink." Other notable products that did not make the cut include NEC's Dr. BonD-S and Rockwell's Net-Hopper; both vendors were revamping their products and declined to participate. U.S. Robotics' interesting new NetServ-er/8 rolled out too late for inclusion.

TWO-SIDED SERVERS

You can think of a remote-node server as having a LAN side and a WAN side. On the LAN side, you want connections for your Ethernet or Token-Ring cabling and support for the networking protocols used on your LAN (such as IPX and TCP/IP).

On the WAN side, you want multiple serial ports, good security, and fast throughput. Some products, including Microcom's LANexpress 4000, come with internal modems; they're easy to set up but more difficult to upgrade as standards evolve. Others have only serial ports, so you have to supply the modems. This makes the initial setup more complex, but upgrading modems later is easier. As ISDN becomes more widely available, you'll appreciate the ability of products like Novell's NetWare Connect

to accept adapters for practically any kind of leased line or ISDN device.

Everyone worries about security—and rightly so. All of these products challenge callers with a password, and all except those from Attachmate, IBM, and 3Com can call a user back at a preprogrammed number to foil intruders. Some will respond only to a specific address generated by the client software; you can even use external hardware dongles to protect At-

FOR THE USER



Remote Office Gold is a breeze to use and shows simulated modem lights on-screen. The LanRover/E lets you configure application icons that connect you to the network when launched.

Telebit's NetBlazer doesn't offer true Windows support. It does run Windows, but its client is really DOS-based. Expect to exit Windows when establishing or breaking a remote connection.



tachmate Corp.'s RLN Turnkey Server.

Centralized administration is a valuable feature. If you're on a NetWare LAN, take a look at AccessBuilder, LanRover/E, and Remote Annex 2000. These packages use NetWare's Bindery to identify callers. If you're not on NetWare, consider how products like the LanRover/E and RLN Turnkey Server can share a centralized caller database. But most products

that use the central Bindery use the unencrypted Password Authentication Protocol (PAP) because binderies can't respond to the Challenge Handshake Authentication Protocol (CHAP)—a newer encryption scheme. Only Microsoft and Shiva use the Secure Password Authentication Protocol (SPAP), which provides encrypted passwords in a centralized database.

Monthly phone charges dwarf initial costs of remote-node equipment, so use the lines wisely. Remote-node systems move more data across phone lines than remote-control systems, so use V.34 modems to get the fastest signaling on these links. Also, select products that limit and compress the data as much as possible.

Some products use proprietary communications schemes on the analog phone-line link, but we recommend selecting those that follow the Point-to-Point Protocol (PPP) defined by the Internet Engineering Task Force. Shiva aggressively backs PPP technology, and several companies, including Farallon and Microsoft, license Shiva-PPP. (For details on Farallon's product, see the sidebar "Timbuktu Pro for Windows" in the remote-control article.) But PPP does not include a standardized data-compression scheme, so the products built on ShivaPPP can still differ in throughput.

(ALMOST) UNIVERSAL CLIENT

The client software redirects requests for network service out the serial port

Suitability to Task:

Remote-Node Servers

The call for remote access might come from end users, but network administrators are charged with buying it. The best remote-node servers address the concerns of both, offering simple installation and configuration, centralized management, and extensive security—while keeping access easy.

We rate each product for power and ease of use. *Power* refers to the wealth and strength of features, and *ease* reflects the usability of those features.

Installation and configuration of remote-node servers should take little effort. For most users, turnkey servers are preferable to server software that runs on a PC with a multiport serial card. In the office, a network manager should be able to configure the

SUITABILITY TO TASK

Product Name	Power		Ease	
	Power	Ease	Power	Ease
Installation and configuration	Poor	Fair		
Management and security	Fair	Good		
Remote-client access	Good	Excellent		

remote-node server by using existing security, resource allocation, and user information. For remote clients, easy-to-follow installation procedures and protocol and modem auto-detection are clear advantages. There should be minimal impact on the current setup, adding little overhead and allowing easy connection and disconnection from the network.

A successful remote-node server also needs to be easy to maintain and secure. In our **management and security** task, we evaluate how groups and users are created and managed, a product's ability to monitor and control the activity of remote-access

sessions, the access and setup of network services such as applications or printers, and the configuring and monitoring of communication ports. We look for restricted dial-back, password authentication, and data encryption. Products that restrict access to information based on methods beyond passwords, such as packet filtering, offer higher levels of security. We also note support for third-party security devices

If **remote-client access** remains too slow or too difficult, it's a sure bet that your remote-node server won't be used. We consider how products perform under a variety of workloads that can consist of sending and receiving e-mail and transferring files. In dealing with analog phone lines, reliability will always be a factor; the ability to reconnect to a disconnected server dynamically is critical. End users should be able to connect and disconnect remotely in Windows without exiting to DOS. Utilities should also warn users of lengthy file-transfer times.

and controls the connection. Shiva is aggressively working to give its remote-node client software universal capabilities. Microsoft developed the 32-bit Windows 95 and Windows NT remote-client code with Shiva's consultation. When you load the Shiva client on top of ShivaPPP, you can interoperate with access servers from Microsoft, Shiva, Telebit, and 3Com. If you call a Shiva server with the Shiva client, you get features such as compression and SPAP that you don't get when you call other brands of servers. Similarly, Stampede licenses its Remote Office Gold PPP client software to Cisco and Digital for their remote-access products.

If you have users calling in with Macs or with OS/2-equipped PCs, make sure that the server you choose has client software for them. Note that IBM's LAN Distance doesn't have a DOS client. Our Summary of Features lists the client software available for each product.

DIALING OUT

We tend to focus on the ability of remote-node servers to accept incoming calls, but many of the products also allow people on the LAN to use the device's modems and phone lines to call out. This feature saves the cost of putting a modem and dedicated phone line on every desktop.

Practically all modern communications programs can address one or more of the protocols commonly used to move modem data across a LAN, including the NetWare Asynchronous Services Interface (NASI), the Network Communications Services Interface (NCSI), and Interrupt 14. A few products—such as the AccessBuilder 2000, the RLN Turnkey Server, and RAD's MBE-RAS—don't provide dial-out capabilities.

We didn't have to stretch to find differences among these products. As our reviews show, there are lots of choices in the remote-node pile.

Our Contributors: FRANK J. DERFLER, JR., is senior networking editor and ROBERT P. LIPSCHUTZ is a technical director of *PC Magazine*. STEVE RIGNEY is the head of a network consulting group based in Destin, Florida, and a contributing editor of *PC Magazine*. PADRAIC BOYLE and TONY POMPILI are networking consultants and frequent contributors to *PC Magazine*. STEVEN MAGIDSON is a networking and workgroup consultant and a contributor to *PC Magazine*. DAVID GREENFIELD was the senior editor in charge of this story, and JEFFREY G. WITT was the project leader.

Shiva LanRover/E PLUS 3.5

In the field of remote-node servers, Shiva's LanRover/E PLUS 3.5 truly stands out. It continues to offer the best blend of ease of use, performance, security, and management. Microsoft Windows 95 users will be pleased to know that they can dial-in to

the LanRover/E without additional software; the operating system is scheduled to ship with Shiva's client drivers. Others will be pleased with the LanRover's intuitive interface and its unlimited free client software.

Network managers can make remote access even simpler by configuring special application icons. Clicking on the icon dials the user in to the network and launches the local application. It's that easy. And for users looking to combine remote node with remote control, Farallon's innovative Timbuku Pro for Windows includes LAN-based remote-control features with Shiva's client.

The only disappointing features of the LanRover/E were in its network-

management facilities. To access detailed port statistics, you currently must use a costly SNMP management platform.

If your priority is network management, consider remote-node servers from Attachmate Corp. and Micro-

com. Another product, the Cisco 2509 Access Server, is a serious contender for any network that uses Cisco routers.

If price is an issue, consider a software-based remote-node server such as Stampede Technologies' Remote Office Communications Server. For \$1,295, you get a four-port DigiBoard and client software that will work with remote-node servers from Cisco as well as servers from Digital and Xyplex (not reviewed here).



Attachmate Corp.

RLN Turnkey Server

BY TONY POMPILI

With its shared databases and broad network protocol support, Attachmate's RLN Turnkey Server may appeal to the enterprise-minded. But it is difficult to set up, has no IPX-based administration, and yielded lackluster performance on our tests.

Since the RLN Turnkey is basically a bridge, you can use any network protocol. The RLN Turnkey comes in a rack-mountable chassis; a software-only ver-

sion is also available. For remote control, Attachmate offers the optional RLN Application Server, which allows multiple users to run remote-control sessions on a single server. The RLN Turnkey includes an SMC Ethernet adapter and Attachmate's own four-port Intelligent Multi-Port Adapter (IMPA) card.

The product has features that should suit enterprise remote-node environments. Attachmate includes an easy-to-use client-disk-creation utility that allows administrators to create custom installation disks for DOS, Microsoft Windows, and OS/2 clients. Multiple servers can share the same database of users and rights, so they can be managed as groups. The complete set of servers is manageable via SNMP. But though the management software shows detailed information on LAN traffic and port status, it shows little information on user activity.

The client software itself works fine and has the useful feature of allowing you

SUITABILITY TO TASK

RLN Turnkey Server

	Power	Ease
Installation and configuration	Good	Fair
Management and security	Excellent	Excellent
Remote-client access	Good	Good

to filter out unnecessary broadcast traffic such as NetWare Service Advertising Protocols (SAPs). Attachmate's OS/2 client still needs a bit of refining: You can't avoid network error dialog boxes during start-up even when the package is installed properly.

Setup and configuration must be done using an onerous text-only interface. As with some other servers in this roundup, you must attach a terminal or PC with communications software to the serial port in the back.

If you have an IP-based network, you can use Attachmate's Windows-based RLN Manager remote-server configuration program to configure and monitor one or more RLN Turnkey Servers more easily. But though the RLN Turnkey offers some powerful error and activity logging, you can view the logs only through a terminal console equipped with RLN Manager.

Attachmate, which last year acquired DCA and its RLN Server product family, recognizes the product's shortcomings in IPX management and its lack of dial-out capability. Later versions will address this and other problems, including the client's incompatibility with the current NetWare VLM version that we saw in our testing.

Unless you're primarily running IP, you will want to wait for Attachmate's next software upgrade and see whether the company lives up to its promises.

RLN Turnkey Server. List price: With 4 ports, \$5,390. Attachmate Corp., 8230 Montgomery Rd., Cincinnati, OH 45236; 800-274-6633, 513-745-0500; fax, 513-745-0435.

Circle 510 on reader service card

Cayman Systems Inc.

Gator Access MP

BY PADRAIC BOYLE

For a good expandable, multiprotocol remote-node solution, consider Cayman Systems' Gator Access MP. The base model, priced at \$2,995, offers above-average performance and good security but has some management and client-side liabilities.

The base model comes with a management port and an Ethernet port; the unit also has support for 10 modems (expandable to 30). But unlike such products as Shiva's LanRover/E PLUS and Xylogics' Remote Annex 2000, the Gator Access does not have any LED status indicators on the front of the unit, which makes it difficult to tell at first glance whether a port is functioning.

Both DOS and Windows clients for the Gator Access are simple to use, but you must install the Windows client first to get the DOS files you need. Another big drawback is the lack of on-line help for the DOS client. On a positive note, the client does display helpful status information on the call in progress, and you can set the client to disconnect from the host automatically after anywhere

from 1 to 15 minutes of inactivity.

We ran into several snags while trying to configure the Gator Access. QuickStart, Cayman's Windows-based configuration utility, sporadically dropped connections with the unit and lost modem strings we had entered. Cayman shipped us an updated version of QuickStart that fixed all the problems we encountered except for the modem string bug.

Setting up the Gator Access was simplified by using QuickStart, but as with other products in this roundup, most management features are accessible only from a command line interface via telnet. Cayman provides a telnet utility that works over IPX, but the management interface looks like that of a Unix host.

Good security features include PAP

and CHAP, and additional security is available through the Radius Authentication Server. Dial-back security is available only

through the command line interface and is limited to one phone number per user, which the administrator inputs.

If you're looking for an expandable, multiprotocol solution for remote access, look at the Gator Access MP. The product is an above-average performer, and its only drawback is a lack of some of the graphical statistics offered by its competitors that eases management.

Gator Access MP. List price: With 10 ports, \$2,995. Cayman Systems Inc., 400 Unicorn Park Dr., Woburn, MA 01801; 617-932-1100; fax, 617-932-0853; e-mail, sales@cayman.com.

Circle 511 on reader service card

SUITABILITY TO TASK

Gator Access MP

	Power	Ease
Installation and configuration	Good	Good
Management and security	Excellent	Fair
Remote-client access	Fair	Good

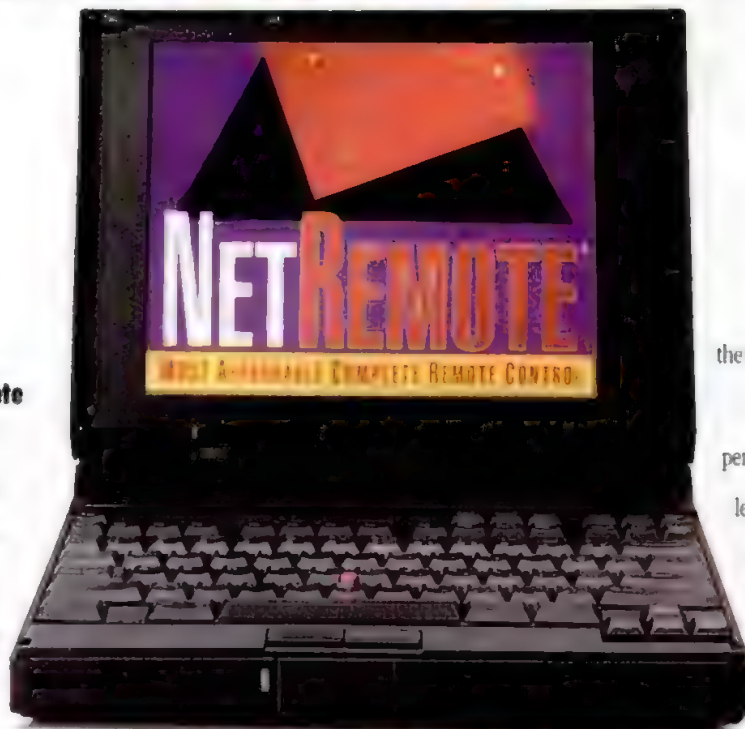


The RLN Turnkey Server includes Attachmate's four-port Intelligent Multi-Port Adapter (IMPA) card.



The Gator Access MP has ten serial ports, a management port, and an Ethernet port on its back panel.

YOU CAN SPEND MUCH MORE ON REMOTE CONTROL SOFTWARE.



Introducing NetRemote. The most affordable complete remote control software.

It's amazing, really. Other remote control programs are almost three times as expensive as the new NetRemote from McAfee. But they provide fewer features.

It's even odder when you consider that NetRemote is the easiest to use. NetRemote installs itself, configures your modem automatically and executes functions at the push of an on-screen button.

Only NetRemote does it all.

Unlike the competition, only NetRemote lets you share data and run programs back and forth between your office PC and remote laptop computer. No matter which one holds the programs or files being accessed.



With NetRemote, all functions are accessible from a simple pushbutton control center.

BUT ONLY IF YOU WANT MUCH LESS.

	NetRemote	pcAnywhere	Carbon Copy
Estimated retail price	\$49.95	\$120	\$130
64-bit remote drive mapping	Yes	No	No
16 million color support	Yes	No	No
Auto install	Yes	Yes	No
Auto modem configure	Yes	Yes	No
Remote printing	Yes	Yes	No

And only NetRemote provides support for 16 million colors and automatically synchronizes your office and laptop PCs to provide

the highest possible screen resolution.

Of course, NetRemote brilliantly performs those functions it shares with lesser programs. To transfer files, just drag and drop. For e-mail, just push a button. Even remote printing is only a trackball click away.

All this and the most affordable price, too.

There's simply no easier, more powerful or more affordable way



to access your office

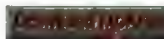
PC from the road. Your LAN administrator will also like NetRemote because it can reduce the support cost of remote access.

And yet, it's powerful enough to provide that access to the entire network, across the hall or across the country.

To order, or for the name of your nearest NetRemote retailer, just call **800-332-9966**. Or, simply "Download McAfee" from the Internet today. And see how much you can get by spending less.



Now available at CompUSA, Egghead, and Computer City.



WebServer: www.mcafee.com Internet: McAfee.com BBS: (408)988-4004 America Online: MCAFEE CompuServe: GO MCAFEE

Telephone (408)988-3832 Fax (408)970-9727 © McAfee Associates, Inc., 1995 All rights reserved All brands and products are trademarks of their respective holders

CIRCLE 299 ON READER SERVICE CARD



The Definition of



ViewSonic 17PS

Sharpness.

.25mm Ultra Fine



Introducing the ViewSonic 17PS. The first 17" monitor with an *Ultra Fine* 0.25mm dot pitch. The ultimate in sharpness . . . precisely what you need!

Our new Ultra Fine monitor truly defines sharpness. With its ultra crisp, ultra brilliant image this powerful monitor is the intelligent choice for your business and graphics applications. Ultra Fine images are nothing new from ViewSonic. The ViewSonic 21PS was the first 21" monitor (19.7" diagonal viewable area) available with a 0.25mm dot pitch, and now it's offered on our top performing 17" monitor (15.7" diagonal viewable area).

The ViewSonic 17PS retains all the superior features that make ViewSonic monitors award winning market leaders. Our OnView™ on-screen control system, Super Contrast screen and exclusive ARAG® anti-reflection, anti-glare screen coating combine to produce the sharpest images possible. PC and Mac compatible, our new 17" monitor supports a maximum resolution of 1,600 x 1,280 and a 77Hz refresh rate at 1,280 x 1,024. The remarkably quick refresh rates and high resolutions offer you crystal clear, flicker-free images. In addition, the ViewSonic 17PS includes *Plug & Play*™* for automatic graphic card configuration with Microsoft's Windows95™, plus TCO certification, the strictest Swedish safety standard.

Designed for your critical desktop publishing, business graphics and CAD/CAM applications, the ViewSonic 17PS is an example of our ongoing commitment to offer you the best monitor at the best price.

Experience the new world class standard in 17" monitors – the ViewSonic 17PS. You'll See the Difference!

ViewSonic®

See The Difference!™

Tel: (800) 888-8583 Ext. 320 or (909) 869-7976
Fax (909) 869-7958
Call FaxSonic (909) 869-7318 (24-hour fax-on-demand)
Request Doc. 153 (17PS), 162 (21PS)
Applelink: VIEWSONIC Compuserve: 73374,514

*Requires a DDC compatible card.
All products and trademarks are brand names of their respective companies. The three bird logo is a registered trademark of ViewSonic Corporation. Specifications and prices subject to change without notice.



CIRCLE 118 ON READER SERVICE CARD

Cisco Systems Inc.

Cisco 2509 Access Server

BY TONY POMILI

Cisco Systems brings its wealth of routing expertise to remote-node access with the Cisco 2509 Access Server. If you have Cisco products in your network, the 2509 is a logical fit, because the product uses Cisco's Internetworking Operating System (IOS) software. Nonetheless, limited documentation and an arcane terminal interface make it a less likely choice for non-Cisco shops.

The 2509 is basically a Cisco router with eight serial ports. The unit has no status lights or indicators—typical of Cisco routers. As you would expect from the leading router company, the \$5,405 enterprise version of this unit (which includes cables and unlimited client software) sup-

SUITABILITY TO TASK
Cisco 2509 Access Server

	Power	Ease
Installation and configuration	Good	Fair
Management and security	Good	Fair
Remote-client access	Excellent	Excellent

ports nearly any protocol that runs over Ethernet or Token-Ring, including AppleTalk, DECnet, and XNS. An IP- and IPX-only model is available for \$3,545 (including client software and cables).

Setting up wasn't pretty. Unless you're familiar with Cisco products, you might need a company representative to help with installation. The out-of-band installation (via a direct serial connection) uses a command line-based terminal program. The server software includes a setup program run from the console that prompts you through a series of port settings. What's worse, there's little on-line help, hardly any paper documentation, and no setup document.

At the time of this review, the 2509 included no PC- or IPX-based management. Cisco's powerful SNMP-based management is IP-only and available under Unix or Hewlett-Packard's OpenView. We had to handle all management from the command line terminal. By the time you read this, Cisco expects to release CiscoWorks for Windows, a Windows version of its IP-based management utility.

The Windows version promises to let



The Cisco 2509 Access Server offers an eight-port serial multiplexer and two serial ports with proprietary interfaces.

users better access the 2509's powerful features. For example, error and activity logging can be reported at one of seven levels—from catastrophic to informative.

Cisco resells Stampede Technologies' Remote Office Gold 2.1 and NTS's TCP-Pro 2.01 (included with the prices listed in this review). Both support IP, PPP, and IPX connections. (See the review of Remote Office in this roundup.)

As a router, the 2509 has the well-known power and flexibility of many Cisco products. But accessing this power from an IPX-based PC is more cumbersome than it needs to be. The soon-to-be-released CiscoWorks for Windows could make this powerful and reasonably priced box more appealing.

Cisco 2509 Access Server. List price: 8-port enterprise model, \$5,405; 8-port IP- and IPX-only model, \$3,545. Cisco Systems Inc., 1525 O'Brien Dr., Menlo Park, CA 94026; 800-553-6387, 415-326-1941; fax, 415-326-1989; Web, <http://www.cisco.com>.

Circle 512 on reader service card

IBM Corp.

LAN Distance Connection Server

BY PADRAIC BOYLE

Only if your network is OS/2-based should you consider IBM's LAN Distance Connection Server. Installing this software solution was extremely difficult, and no DOS client is available. But it's reasonably priced (\$595 for an eight-port license) and offers above-average security and multiprotocol support.

During installation we ran into many problems, which at press time we learned stemmed from incompatibilities with the recommended StarGate multi-

port adapter. Even after we downloaded and applied the patches, we needed to edit the configuration files manually before the LAN Distance server and client were operational. IBM and StarGate expect to correct these problems by the time you read this article.

Naturally, LAN Distance provides a native OS/2 client; it's the only product that does. In fact, IBM's OS/2 Warp Connect bundles LAN Distance with the operating system. Once installed, the OS/2 client is fairly easy to use. An address book is included for dialing in to multiple sites.

LAN Distance also provides Microsoft Windows and Windows for Workgroups clients, as well as support for NetWare and LANtastic. It lacks a DOS client, but you can open a DOS dialog box through OS/2 or Windows and execute DOS commands. A nice feature: LAN Distance allows you to choose how your computer will boot up next—either on a local network or remotely—and it makes the appropriate

SUITABILITY TO TASK
LAN Distance Connection Server

	Power	Ease
Installation and configuration	Good	Poor
Management and security	Good	Good
Remote-client access	Good	Fair

configuration changes for you.

The OS/2-only management software displays port and log-on status, statistics, and port configuration, and it allows you to manage LAN Distance remotely.

If you have an OS/2-based network, LAN Distance may be worth your while. But after spending numerous hours installing LAN Distance and all its patches, we believe that IBM needs to tighten up this product before it is a viable solution.

LAN Distance Connection Server. List price: With 8-port license, \$595. IBM Corp., 11400 Burnet Rd., Austin, TX 78758; 800-342-6672; fax-back, 800-426-4329; Web, <http://www.austin.ibm.com>.

Circle 513 on reader service card

Dear Mr. Gates,

You know, we're not really that different. We both want to make Windows better.

Like you, Quarterdeck has helped folks get more out of PCs right from the beginning. Today, our QEMM 7.5 recovers up to 634K of the 640K that Windows and DOS need. So your PC won't say 'Out Of Memory' when you open that budget for your new home (just kidding).

We know you're really concerned about how much memory Windows 95 needs. Not to worry. We're working on an upgrade of QEMM for Windows 95 and it'll be free to all people who buy QEMM 7.5 after July 15, 1995.

The two of us, changing the world – just like old times, Bill.



QEMM 7.5 is a registered trademark of Quarterdeck Corporation. Windows 95 is a registered trademark of Microsoft Corporation. © 1995 Quarterdeck Corporation. All rights reserved.

CIRCLE 904 ON READER SERVICE CARD

Quarterdeck

LAN Access Corp.

LANA/4e

BY PADRAIC BOYLE

With good performance and simultaneous support for a wide array of network protocols, the LANA/4e provides a complete remote-access solution. At the time of this review, however, the LANA/4e is available only for Ethernet and lacks Macintosh clients, dial out, and data compression—features the company says will soon be available.

The LANA/4e remote-node solution consists of the LANAserver, LANAmanger, and LANAcient software. The four-port LANAserver (\$2,495) has an Ethernet connection on the back of its 19-inch rack-mountable chassis and can reside anywhere on the LAN. (LAN Access also offers an eight-port PCMCIA server.)

The LANAserver's installation was one of the most seamless we've seen, next

to Shiva's LanRover/E PLUS. You can configure and diagnose the LANAserver from the front panel or via LANAmanger.

The DOS and Windows LANAcients were simple to install and operate. During installation, several of the more widely used Novell utilities, including LOGIN.EXE, LOGOUT.EXE, and MAP.EXE, were copied onto the remote workstation for faster operation. You can start the Windows dialer from DOS or the Program Manager but not from a DOS shell within Windows. One of the more complete clients we saw, LANAcient includes filtering, time-outs, and a maximum frame size.

Management capabilities are flexible



LAN Access's LANA/4e has a 19-inch, rack-mountable chassis with four ports and an Ethernet connection.

and cohesive. With LANAmanger, you can view real-time port statistics, such as user names, via an in-band connection or dial-up. You can remotely reset the LANAserver (either port by port or the entire unit) from the LANAmanger station.

The LANAserver showed the power of its 32-bit RISC processor during our performance testing: It was the only product in this roundup that could support 230

Remote Access Meets the OS

By Steve Rigney

Before shelling out a few thousand dollars for a remote-access server, check your desktop or network OS. Microsoft Windows NT, Windows 95, and IBM's OS/2 Warp Connect include remote-access client software; Windows NT Server also includes remote-node server features. Since they are integrated into the OS, these clients are much easier to install. NetWare shops should consider Novell's NetWare Connect or its competitor, Funk Software's WanderLink (see the sidebar "The NLM Option: NetWare Connect and WanderLink").

WINDOWS NT SERVER

The Remote Access Services (RAS) in Windows NT is a full-featured remote-node server for up to 256 simultaneous dial-in/out connections on a single server. Remote-client software comes with Windows for Workgroups, Windows NT Workstation and Server, and Windows 95 for connecting across TCP/IP, IPX, and NetBEUI with a PPP or SLIP connection.

With its Windows NT integration,

RAS can be managed and monitored using all of Windows NT's built-in utilities, such as Performance Monitor and Event Viewer. But we were disappointed by the lack of port statistics. You can also configure Windows NT as an Internet access server or dial-up router.

WINDOWS 95

Though Windows 95 does not contain the same full-featured remote-access server as Windows NT Server, it does provide more remote-client software than any other product in this feature. It also includes the Exchange mail client and Hilgraeve's Hyper Terminal, a standard comm package. A bonus package for Windows 95 should include a variety of Internet tools and a one-port RAS server.

Windows 95 includes all of the client software you need to establish a remote-node connection with a NetWare Connect, Windows 95, Windows NT, LanRover/E, NetModem, and Unix-based remote-node server. The Windows 95 remote-client software supports TCP/IP, IPX, and NetBEUI.

You can simultaneously run multiple protocols when you dial in with the built-in PPP stack.

Using shortcuts, you can create an icon that will automatically establish a remote-node connection when you launch an application. All the remote-client software runs as 32-bit VxDs so you can easily switch between remote connections and local apps without slowing down your PC.

OS/2 WARP CONNECT

Warp Connect does not provide remote-node server features or as many remote-access client drivers as Windows 95, but it does include the LAN Distance remote client (reviewed here) for establishing a connection to a LAN Distance server running TCP/IP, IPX, and NetBEUI. Unlike Windows NT or Windows 95, Warp Connect requires you to reboot before establishing a remote-node connection. Warp Connect also comes with a complete set of Internet-access utilities including a Web browser, SofNet's FaxWorks, and Hilgraeve's HyperAccess Lite comm package. □

techmedia

A Family of Intelligent Systems



IT'S JUST LIKE REAL LIFE

That's right. A family.
You can count on them.
You can be demanding.
You'll always have their support. It's just like Techmedia. We call it *A Family of Intelligent Systems.* Intelligent? Incredibly. Every member of the Techmedia family is designed to understand it's other components. Intimately and intuitively. In fact, once you get to know us, you'll realize there's no end to the possibilities and solutions we can provide. We'll show you how multimedia—and our many products that support it—thrill the senses as well as the mind.

Family support goes a long way, and so do we. Techmedia offers FREE technical support, and a 48 hour repair replacement is guaranteed. So is our limited three year warranty on every Techmedia product. You can count on it.
1-800-379-0077



MONITORS



**MOTIONMEDIA
BOARD**



**CAPTUREMEDIA
CARD**



**OFFICE
EQUIPMENT**



**MULTIMEDIA
SYSTEMS**

CIRCLE 022 ON READER SERVICE CARD

techmedia
Computer Systems Corporation

The fastest of these remote-node servers use sophisticated file compression, support VLM burst mode, and run V.34 modems at full blast.

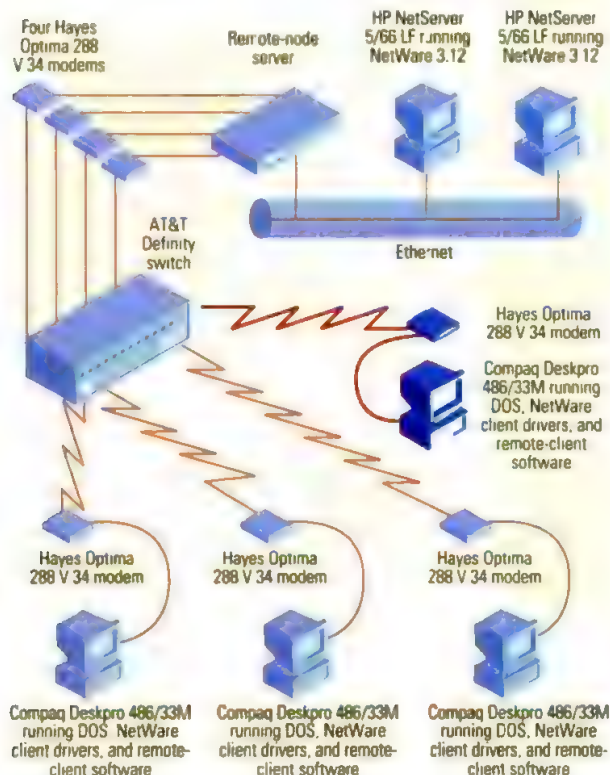
What the Numbers Mean

As a rule, remote-control packages transfer files faster than remote-node servers. Because a remote-node server treats remote PCs as nodes on the LAN, the remote clients have to take the time to divide files into small data packets with additional networking information. Remote-control products avoid that overhead by sending data in large chunks.

Still, we saw major performance differences among remote-node servers. These differences stem from three factors: the compressibility of the packet and the file, whether a server supports NetWare Virtual Loadable Modules (VLMs), and the speed of the line.

The biggest performance differences appear when transferring highly and moderately compressible files. Using file-compression algorithms, remote-node servers can reduce file size and LAN overhead—such as IPX and PPP information. Shiva's LanRover/E PLUS 3.5 and 3Com's Access-Builder 2000 stand out as the fastest servers in this roundup, followed closely by Cayman Systems' Gator Access MP.

Performance Test-Bed



Stampede Technologies' Remote Office Communications Server, and Xylogics' Remote Annex Series 2000. The Shiva and 3Com units transferred files more than twice as fast as Attachmate's RLN Turnkey Server, IBM's LAN Distance Connection Server, or RAD's MBE-RAS.

The packet-bursting technique of VLMs is another major factor that distinguishes performance. With packet bursting in the NetWare VLM DOS requesters, remote-node servers can issue multiple responses to a client's single network request. A server using Novell's NETX shell has more overhead, because it can issue only one response per request.

Neither the Attachmate nor the IBM product used VLMs effectively. The Attachmate product completed our Scalability tests using NETX, resulting in low scores. IBM's LAN Distance, though able to complete the tests, generated errors that caused further delay. Both companies are working to resolve the problems.

DTE (data terminal equipment) speed is the most direct factor determining file-transfer performance. The DTE speed is the speed at which a computer sends data to a modem. All things being equal, a lower DTE speed means a slower transfer rate. At no point was this more obvious than with the MBE-RAS, which couldn't maintain a DTE speed of 115.2 Kbps—despite its marketing claims.

SCALABILITY

As multiple users dial in to a server, another factor affects overall performance: the processor. With four remote clients, some servers' processors simply are not powerful enough to service the incoming requests from all ports.

Using sophisticated hardware, the Shiva, 3Com, and Xylogics units balanced the client load most effectively.

Multi-Tech's MiniArray Turn-Key Communications Server MA8ER/HD and the Attachmate server could not sustain the aggregate client loads. Microcom's LANexpress 4000 also got low scores: On our tests, its V.FC modems could negotiate only a 26.18-Kbps connection with the Hayes V.34 modems.—*Analysis written by Jeffrey G. Witt*

How We Tested

Two factors are key when looking at remote-node server performance: single-client file-transfer timings and scalability as clients are added. We consider both on our performance test-bed. A separate test-bed was used to evaluate installation and configuration, management and security, and remote-client access.

For our **Scalability** tests, we copied four types of files from the host to the remote PCs: a highly compressible graphics file (983K) with a compression ratio of 7.7 to 1, a moderately compressible text file (328K) with a 2.5-to-1 ratio, a slightly compressible executable file (197K) with a 1.3-to-1 ratio, and a noncompressible file (131K) with a 1-to-1 ratio.

We measured each remote-node server's scalability by using NetBench 3.0 to transfer these files simultaneously to four remote clients. Specifically, we used the Sequential Read test with a 1K block size for each file type. Total transfer times are reported for one remote DOS client, followed by aggregate scores for two and four simultaneous remote DOS clients. These numbers also

The **EASIEST** way to create **CDs**



Corel CD Creator was designed with you in mind—it's an easy, affordable and comprehensive program that lets you create CDs effortlessly. Ideal for professionals and beginners alike, the Disc Wizard included with the program will make CD recording a simple and familiar process for any user.



1 To design the layout of the information simply drag and drop data and audio files directly to the Corel CD Creator window.

2 Using a CD recorder you can now "burn" your CD.

3 Create your own jewel case insert or use the sample templates provided.

Corel CD Creator provides a secure and durable medium for storing your vital data with quick and easy access. The CDs you create can then be played on virtually every CD-ROM drive or audio player—making Corel CD Creator the most user-friendly CD recording software on the market!

"Corel CD Creator is definitely king of the mountain... it won our Best of Times award."

1 AN Times
January, 1995

"The genius of CD Creator is that it hides the complexity and makes creating your own CD-ROMs a familiar process."

PC Magazine
February, 1995

"Simply the best CD authoring package available."

PC Pro
February, 1995

Features:

- Create mixed mode discs (audio and data)
- "Drag and drop" layout design using OLE 2.0
- Support for single session and multisession discs
- Writes MS-DOS or ISO-9660 file names
- Includes a WAV file editor
- Create your own customized CD jewel case insert
- Includes a utility to create your own compilation Photo CD



Did you know...?

**CD recorders can be purchased
for as little as \$1500*!**

Corel CD Creator works with virtually all CD recorders. To create your own CDs, you will also require a CD recorder. For a complete list of Corel certified recorders, please call 1-613-728-0826 ext. 3080. Document # 1010

TigerDirect
1-800-CD-TIGER
1-800-238-4437

\$179⁰⁰*

COREL®

Call now for faxed literature!
1-613-728-0825 ext. 3080
Document # 1012

*US\$ plus applicable taxes.

CIRCLE 023 ON READER SERVICE CARD

KLH-0136

Performance Tests: Remote-Node Servers

indicate how the server would perform under a transaction-based client/server application.

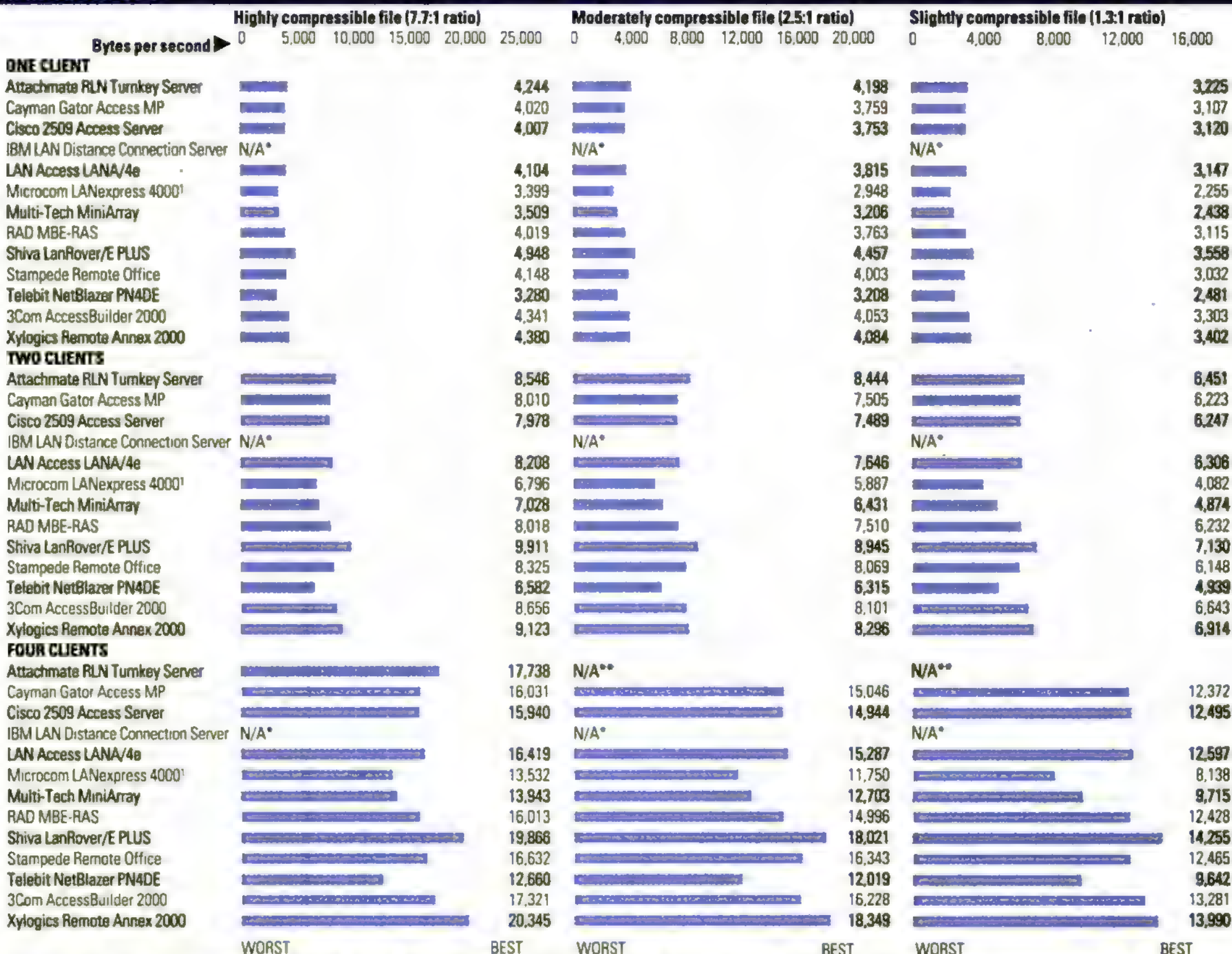
For our **Remote File Transfer** tests, we used the DOS copy command to transfer the same four files to a single client.

For all tests, we set the DTE rate of the serial

ports of each remote-node server and client to 115.2 Kbps. Each modem was set to its default, with V.42bis compression enabled. Microcom's LANexpress (the only product in this roundup that required internal modems) was tested using its internal V.FC 28.8-Kbps modems.

All dial-in users were configured with vendor-provided PPP software and NetWare VLM 1.2 drivers using the IPX protocol. There were a few exceptions: We used NetWare's NETX for the Multi-Tech unit on our Scalability tests and for the Attachmate unit on the Remote File Transfer tests. LAN Distance was

SCALABILITY



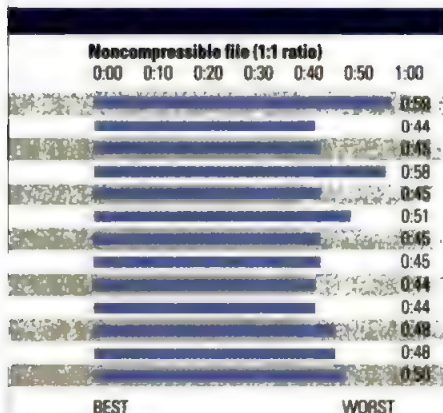
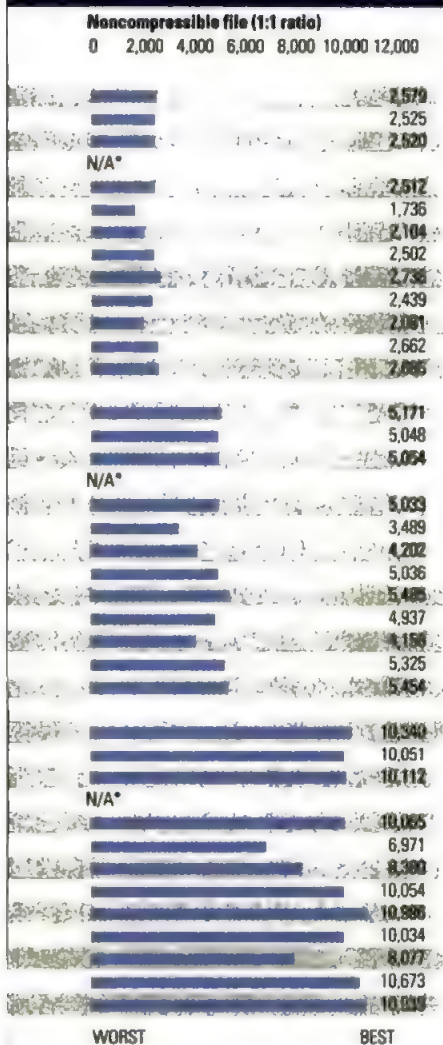
¹ We tested this product with Internet V Fast modems. N/A*—Not applicable. The product does not have a DOS client. N/A**—Not applicable. The product did not complete this test.

REMOTE FILE TRANSFER



¹ We tested this product with Internet V Fast modems.

tested for throughput using the DOS shell in OS/2 Warp because LAN Distance does not include a native DOS client. We were unable to include LAN Distance in our Scalability tests because of a timing incompatibility we found between NetBench and the DOS shell in Windows and OS/2.



SUITABILITY TO TASK

LANA/4e

	Power	Ease
Installation and configuration	Good	Good
Management and security	Good	Excellent
Remote-client access	Fair	Good

Kbps on the serial ports.

When LAN Access delivers some additional features, the LANA/4e will become a fully rounded product. (As we went to press, LAN Access was in merger discussions with Digi International.) The current version of LANA/4e—with multiple simultaneous protocol support, easy operation, and very good performance—is a strong remote-access solution.

LANA/4e. List price: With 4 ports, \$2,495. LAN Access Corp., 2730 Monterey St., #105, Torrance, CA 90503; 310-328-9700; fax, 310-328-9696.

Circle 514 on reader service card

Microcom Inc.

LANexpress 4000

BY STEVE RIGNEY

If you need a turnkey remote-node server with excellent setup and management features, you will want to consider Microcom's LANexpress 4000. Unlike all the other products we reviewed, the LANexpress is available only with internal 28.8-Kbps modems. It also includes all of the software you need to establish both dial-in and dial-out remote-control and remote-node connections.

Considering that the four-port model includes four internal V.FC 28.8-Kbps modems for a list price of \$4,999, the LANexpress is fairly inexpensive. But you don't have the option of adding external modems to the unit. Also, the remote-client software costs \$425 for 20 users; if you want to add remote control, you will have to shell out another \$425 for 20 copies of Microcom's Carbon Copy (see the review in "The Art of Being Remote: Access and Control"). The large size of the server's chassis and the

fact that you have to use the integrated modems may discourage some potential customers.

Installation is pretty simple, because you don't have to set up each port and each modem. You need only define user names and any other security options with the included expressWatch configuration utility.

The network management and user statistics that expressWatch provides are a network administrator's dream: In addition to real-time monitoring and control of individual ports, it keeps a log of information such as line quality. Besides get-

SUITABILITY TO TASK

LANexpress 4000

	Power	Ease
Installation and configuration	Good	Good
Management and security	Excellent	Excellent
Remote-client access	Good	Excellent

ting standard security options such as passwords and dial-back, you can limit a user's connection time and disable an account after a set number of failed log-ons.

The Windows-based LANexpress remote software is easy to use and has one of the best interfaces in this roundup. You can start a network connection with a few clicks of your mouse. But the DOS client for LANexpress does not come with an intuitive interface, and to install it you must edit several configuration files before you can connect to the remote LAN. Unlike Shiva's LanRover/E PLUS client, the LANexpress remote client does not currently use PPP, which allows you to run multiple protocols simultaneously. Microcom says the next release of the client, scheduled for August, will support PPP.

The LANexpress is easy to install and



Microcom's LANexpress 4000 was the only server we reviewed that has four integrated V.FC 28.8-Kbps modems.

manage. But if you want to use your own modems, a comparable product such as the LanRover/E PLUS may provide the features you want.

LANexpress 4000. List price: With 4 ports and 4 V.FC modems, \$4,999. Microcom Inc., 500 River Ridge Dr., Norwood, MA 02062; 800-822-8224; fax, 617-551-1021; e-mail, remoteaccess@microcom.com.

Circle 515 on reader service card

Multi-Tech Systems Inc.

MiniArray Turn-Key Communications Server MA8ER/HD

BY TONY POMPILI

Although Multi-Tech's MiniArray Turn-Key Communications Server MA8ER/HD comes as a self-contained PC with software preinstalled, ready to drop into your network, it has some significant drawbacks. Poorly documented client configuration, limited support for PC protocols, and substandard performance limit its usefulness. But the MiniArray does include some of the best management features among the units we reviewed.

The MiniArray includes a hard disk, floppy disk drive, Ethernet adapter, and Multi-Tech's proprietary multiport Intelligent Serial Interface (ISI) serial card. The \$3,999 server supports eight ports and offers the option of adding up to 32 ports with additional ISI cards. On our Scalability tests, however, we found that the MiniArray bogged down with as few as four users. The software and one eight-port ISI card are sold separately (\$2,099) for installation on your own PC.

The MiniArray's configuration program runs directly on the server, unlike products that require a terminal to be connected. The software comes preinstalled on the server, and we found it relatively easy to configure the ports and select the modems.

The client side was

SUITABILITY TO TASK		
MiniArray Turn-Key Communications Server MA8ER/HD		
	Power	Ease
Installation and configuration	Poor	Good
Management and security	Excellent	Good
Remote-client access	Fair	Fair

not as simple. In addition to dealing with paltry documentation, we consistently encountered network errors while attempting to load or execute files as small as 70K in either DOS or Windows. Multi-Tech said the client software we tested, Remote Node Client, Version 2.11a, caused network problems when run with NetWare VLM drivers. Multi-Tech expected to have a fix by press time.

Though it supports PPP, Remote Node Client does not use either the PAP or CHAP authentication protocol, relying instead on its own security scheme. So you can use only the Multi-Tech client software with the MiniArray.

With the character-based graphical interface, we found it simple to perform management tasks. Most server configuration settings can be modified remotely from Multi-Tech's Server Console for Windows and DOS. Multi-Tech's combination of remote and local management gives it some of the most flexible management features of the servers in this roundup.

The MiniArray is an administrator-friendly system with fast, simple server hardware and software installation. However, the poor performance that it yielded on our Scalability tests as several simultaneous connections were added may leave remote users frustrated.

MiniArray Turn-Key Communications Server MA8ER/HD. List price: With 8 ports, \$3,999. Multi-Tech Systems Inc., 2205 Woodale Dr., Mounds View, MN 55112; 800-328-9717, 612-785-3500; fax, 612-785-9874; e-mail, multi-tech@winternet.com.

Circle 516 on reader service card



The MiniArray Turn-Key Communications Server MA8ER/HD uses Multi-Tech's proprietary eight-port ISI (Intelligent Serial Interface) card.

RAD Data Communications Inc.

MBE-RAS

BY STEVEN MAGIDSON

Administrators looking for a low-cost remote-node solution might consider RAD Data Communications' MBE-RAS (\$3,000). But its shortcomings in management and the absence of true Microsoft Windows for Workgroups or OS/2 Warp client drivers make it less suitable for today's typical user environments.

The MBE-RAS is several thousands of dollars less expensive than other remote-

FOR THE NETWORK MANAGER



Little things really matter. We liked the LANA/4e's touch control and LCD. These configuration features were much more convenient than setting up a terminal session.

RAD's unit had a controller chip that didn't fit its socket. RAD's fix? Insert paper as a spacer. We got a new box but it had the same problem; on removing the chip, we found tape on the bottom.



node servers. The list price ranges from \$2,700 for two ports to \$3,600 for eight, including a 20-user client license. (An additional 100 clients cost \$600.) We reviewed the four-port model, which sells for \$3,000.

Though not difficult, configuring the MBE-RAS was very clumsy, and we found the unit somewhat limited in functionality. We had to use a character-based interface to configure the box. Also, performance was poor; on our tests, the unit lowered its port speeds to 38.4 Kbps.

Administration is standard, if minimal. The MBE-RAS supports call-back options, user passwords, and MAC address checking for security, all of which worked perfectly on our tests. But there is no dial-out or auditing capability, and the MBE-RAS offers limited link statistics.

Client operation under DOS was sim-

SUITABILITY TO TASK		
MBE-RAS		
	Power	Ease
Installation and configuration	Fair	Poor
Management and security	Fair	Fair
Remote-client access	Fair	Fair

Searching For The Best Multimedia Pentium Notebook?

CHECK OUR REFERENCES.



BYTE Magazine
has just chosen
the **Sceptre**

**Soundx Multimedia
Pentium Notebook BEST
OVERALL** after head-to-
head comparisons with the
best notebooks available.

You'll find excellence in
every product Sceptre
produces. That's why, year
after year, we continue to
win performance awards
from the industry's toughest
critics.

Add your voice to the
growing list of satisfied
Sceptre users. Call
1-800-788-2878 for the
dealer nearest you.

- INTEL 75/90 MHZ PENTIUM PROCESSOR
- 10.4" DSTN TFT WITH 256 COLORS
- PCI BUS TO INCREASE HDD SPEED
- FULL SIZED 86 KEY POSITIVE TOUCH KEYBOARD WITH ENHANCED FEEL AND RESPONSE
- BUILT-IN STEREO SPEAKERS AND MICROPHONE
- BIOS USES 256K CACHE TO MONITOR HEAT TRANSFER
- 6.3 POUNDS: 10.9" x 8.6" x 1.7"
- INFRARED SERIAL PORT



SCEPTRE

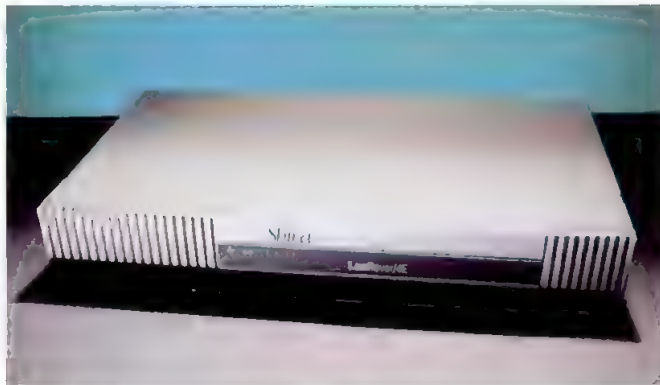
EXCELLENCE FOR ALL THE WORLD TO SEE

© 1995 SCEPTRE Technologies, Inc. All Rights Reserved. All product and brand names are trademarks or registered trademarks of their respective companies.

CIRCLE 256 ON READER SERVICE CARD



In addition to the four-port version, RAD Data Communications' MBE-RAS is available with two or eight ports.



Shiva's four-port LanRover/E PLUS 3.5 is easy to install and includes dial-out capability.

ple, and with the auto-reconnect option the MBE-RAS recovered automatically from a wide range of cable disconnections. But the lack of Windows for Workgroups client software required us to change SYS-TEM.INI and other files manually.

Many of these issues are expected to be addressed in the next version, which should ship by August of this year. But despite the MBE-RAS's low cost and wide range of WAN interfaces, we cannot justify this product as the remote-access server of choice.

MBE-RAS. List price: With 4 ports, \$3,000. RAD Data Communications Inc., 900 Corporate Dr., Mahwah, NJ 07430; 800-444-7234, 201-529-1100; fax, 201-529-5777; e-mail, easy@radusa.com.

Circle 517 on reader service card

Shiva Corp.

LanRover/E PLUS 3.5

BY STEVE RIGNEY



Wherever you look for remote access these days, Shiva Corp. is there. Aggressive bundling agreements with the likes of Microsoft put Shiva's client protocol stack in Windows 95 and several third-party applications—and of course, in the LanRover/E PLUS 3.5 (\$4,999). You'll want the LanRover/E for its simple installation, ease of use, and good performance, but you may find the server management to be merely adequate.

Shiva's simple and easy-to-use client is one of the best we saw. Anyone can easily set up a Windows icon that automatically

dials a connection and then launches an application on the host network. The DOS or Windows software can dial in and dial out of the LanRover/E and lets you configure multiple connections to multiple hosts.

The LanRover/E was also one of the best performers on our tests and was the fastest of the group for all file types with one client. The four-port model we reviewed includes unlimited free client software, which can cost \$50 per client with some other servers. You'll need to purchase extra modems separately, which costs extra but offers added flexibility.

Installing the LanRover/E is just a matter of connecting the modems, network cable, and power cable. Using the Shiva Network Manager (SNM) utility, you configure the ports, security, and other parameters (including dial-in and dial-out). Unlike most remote-node servers, the LanRover/E can use NetWare's Bindery for user security. SNM, which runs on Macintosh or Windows PCs, allows you to manage any LanRover/E or NetModem (Shiva's single-port remote-node server) anywhere on the network.

But though you can use SNM to gather basic port statistics, you can't gather detailed caller information or create a usage audit log. Other products, such as Microcom's LANexpress 4000, will log all callers, their connection times, and the amount of data transferred. To view this information

on the LanRover/E, you can use an SNMP management utility such as OpenView, but it would be more useful if a utility for such information were included.

The LanRover/E is definitely a good choice for an organization whose users need dial-in and dial-out access to a network. But if you need strong management features, you should consider investing in a third-party SNMP management console. **LanRover/E PLUS 3.5.** List price: With 4 ports, \$4,999. Shiva Corp., Northwest Park, 63 Third Ave., Burlington, MA 01803; 800-977-4482, 508-788-3061; fax, 617-270-8599; e-mail, sales@shiva.com. Circle 518 on reader service card

Stampede Technologies Inc.

Remote Office Communications Server

BY TONY POMPILI

Hardware independence and simple installation make Stampede Technologies' Remote Office Communications Server one of the most powerful yet flexible remote-node servers here. This installation-friendly system includes intuitive and nonintrusive client software, and at \$1,295, it's one of the least expensive products in this story—even when you factor in the cost of a dedicated PC.

Remote Office includes server and client software and a four-port Digi-Board. Stampede also sells a two-port, software-only version of Remote Office for \$395. You must provide a 386-based or better PC with DOS and a network adapter as the server. Since the server software is a 111K TSR, it can run on a PC that doubles as a print server.

SUITABILITY TO TASK

LanRover/E PLUS

	Power	Ease
Installation and configuration	Excellent	Excellent
Management and security	Good	Good
Remote-client access	Excellent	Excellent

BUILT TO ORDER

High Quality Custom-Configured Systems At Off-The-Shelf Prices

Precision Engineered Power Systems!—SAG file servers are built with precision and offer features like multiple processing, disk mirroring, RAID 5 fault tolerance—plus more storage capacity at prices the competition just can't beat. Affordable Disk Arrays, Tape Backup Solutions and RAID 5 Technology from SAG Electronics "The High-End Solutions Company."

We've Outclassed the Competition!—SAG incorporates the highest quality components in all its systems like MICRONICS motherboards, ADAPTEC controllers and Seagate, Quantum & Micropolis hard drives. Performance, reliability and customer satisfaction is what we're all about. We are the only vendor to offer fully configured custom engineered servers and storage solutions.

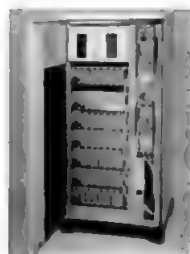


Compatibility Guaranteed! Expert Software Services Available!—All our systems are guaranteed to work with your operating software. We provide expert services on OS/2, SCO, Novell, and Windows NT operating systems.

Buy Direct from SAG Expert Technicians!—SAG expert technicians and knowledgeable sales personnel can configure a custom solution to meet both your technical and financial requirements. We have been satisfying the technical demands and needs of our customers since 1987.



THE SAG TOWER OF POWER



SAG TERABYTE



PC RACK MOUNT SOLUTIONS



STACKABLE MODULAR DRIVE SOLUTION



DUAL MOTHERBOARD 16-BAY 400 WATT REDUNDANT POWER

GRAPHICS POWER STATION 133MHZ

- IMAGINE 128, FASTEST, GRAPHICS, DRIVE, AND MOTHERBOARD
- 1 INTEL 133 MHZ PENTIUM
- 256K PIPELINE SRAM CACHE
- TRINITY CHIPSET "EDO MEMORY OPTION"
- 16MB RAM EXPANDABLE TO 128MB
- SLOTS: (4) PCI (4) ISA
- ADAPTEC 2940W, SONY 4X CD-ROM
- #95 IMAGINE 128-BIT GRAPHICS 4MB VRAM
- 4GB 7200RPM SCSI WIDE
- MICROSOFT MOUSE, 101 KEY-BOARD
- MS-DOS & WINDOWS FOR WORKGROUPS
- MINITOWER

\$4099

120MHZ 9GB SERVER

- INTEL 120MHZ PENTIUM
- 256K BURST SRAM CACHE
- 9GB 11 MS HARD DRIVE
- 16MB EXPANDABLE TO 128MB
- 4X CD ROM SCSI
- INTEL 100 BIT PCI ETHERNET
- ADAPTEC 2940
- TRINITY CHIP SET, EDO MEMORY OPTION
- SLOTS: (4) PCI (4) ISA
- TOWER CASE, 300 WATT

\$4439

RAID 5 SERVER DUAL 100MHZ SMP

- 1 INTEL PENTIUM 100 MHZ CPU
- 512K CACHE
- 16MB RAM EXPANDABLE TO 512MB
- 3 TWO GB, 8MS HARD DRIVES
- RAID 5 CONTROLLER
- SLOTS: (3) PCI, (5) EISA
- 12 BAY TOWER, 8 REMOVABLE, AND HOT SWAPPABLE
- TWO 300 WATT REDUNDANT POWER SUPPLIES
- KEYBOARD AND 1.44 FLOPPY

\$6895

DUAL 133 MHZ SMP MULTIPROCESSING FILE SERVER

- DUAL 100MHZ & 90 AVAILABLE
- 2 INTEL 133MHZ PROCESSORS
- 512K CACHE
- 32MB RAM EXPANDABLE TO 512K
- 4GB 7200 SCSI WIDE
- SLOTS: (3) PCI, (5) EISA
- SONY 4X CD ROM SCSI
- ADAPTEC 2940W
- #9 2MB PCI VIDEO
- KEYBOARD, FLOPPY, MS MOUSE
- TOWER CASE 300 WATT

\$5433

RAID 5 SOLUTIONS REDUNDANT POWER SUPPLIES HOT SWAPPABLE DRIVES ALL SOLUTIONS UPGRADABLE

6GB	7200RPM	SCSI	\$5683
12GB	7200RPM	SCSI	\$6663
12GB	7200RPM	SCSI-WIDE	\$8525
63GB	5400RPM	SCSI	\$20442

STORAGE SOLUTIONS

		INT.	EXT.
9GB	SCSI	\$2000	\$2125
4GB	SCSI 7200RPM	\$1075	\$1175
4GB	SCSI-WIDE 7200RPM	\$1115	\$1240
2GB	SCSI 7200RPM	\$820	\$920
2GB	SCSI-WIDE 7200 RPM	\$854	\$980
96GB	4MM TAPE LIBRARY		\$4000

WE ONLY BUILD CUSTOM SOLUTIONS! CALL FOR PRICING.

1.800.989.3475

SAG ELECTRONICS • 451 ANDOVER STREET • NORTH ANDOVER, MA 01845 • 508-682-0055 • FAX 508-689-0180
HOURS: 8:30AM-8:00PM, MONDAY-FRIDAY

GSA SCHEDULE PENDING

CIRCLE 309 ON READER SERVICE CARD

SAG ELECTRONICS

AT&T on-site and 4 year extended warranties are available. Lease options available. Returns may be subject to restocking fee. RMA# must be acquired.

SAGPC61695

SUMMARY OF FEATURES

Remote-Node Servers

	Attachmate RLN Turnkey Server	Cayman Gator Access MP	Cisco 2509 Access Server	IBM LAN Distance Connection Server	LAN Access LANA/4e	Microcom LANexpress 4000	Multi-Tech Mini- Array Turn-Key Communications Server MA8ER/HO
■ YES ■ NO							
Products listed in alphabetical order							
List price (tested configuration)	\$5,390	\$2,995	\$5,405	\$595	\$2,495	\$4,999	\$3,999
Number of ports	4	10	8	N/A*	4	4	8
Hardware/Software	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Hardware							
Dimensions (HWD, in inches)	4 x 17 x 17	7 x 17 x 12	1 x 11 x 18	N/A**	2 x 17 x 9	6 x 17 x 17	4 x 14 x 11
Firmware version	3.1	3.02	IOS 10(2)	N/A**	1.2	2.1	2.11a
Internal/external modem support	■ ■	■ ■	■ ■	N/A**	■ ■	■ ■	■ ■
Maximum DTE speed	115.2 Kbps	115.2 Kbps	115.2 Kbps	N/A**	230.4 Kbps	115.2 Kbps	115.2 Kbps
Network connections supported	Ethernet (AUI, BNC, RJ-45), Token-Ring	Ethernet (AUI, BNC, RJ-45)	Ethernet (AUI), Token-Ring	N/A**	Ethernet (AUI, BNC, RJ-45)	Ethernet (AUI, BNC), Token-Ring	Ethernet (BNC, RJ-45)
Dial-in/Dial-out	■ ■	■ ■	■ ■ (IP only)	■ ■	■ ■	■ ■	■ ■
Dial-up routing	■	■	■	■	■	■	■
Software							
Remote-node software and version	RLN Client 3.1	Cayman Client 3.03	Cisco Remote Access Client NTS 2.01, Stampede Remote Office 2.1	IBM LAN Distance 1.11	LANAclient 1.20	Carbon Copy 2.5 (remote control), LANexpress Remote Client 2.1	Remote Node Client 2.11a
Memory used by ODI-compliant client drivers	55K	50K	30K	40K	57K	66K	54K-100K
Novell utilities included							
LOGIN/LOGOUT/MAP	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Compression schemes							
Run length encoding	■	■	■	■	■	■	■
Lempel-Ziv-Welch/Header compression	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
NOS Protocols Supported							
PPP	■	■	■	■	■	■	■
AppleTalk, TCP/IP	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Microsoft Windows NT 3.5 NWLink, NetBEUI	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
NetWare 3.x and 4.x (IPX)	■	■	■	■	■	■	■
LANtastic, OS/2 LAN Server	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Security							
Call-back/Requiring call-back	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Data encryption	■	■	■	■	■	■	■
Can integrate log-on with NetWare's Bindery	■	■	■	■	■	■	■
Connection time limit	■	■	■	■	■	■	■
Password-authentication standards supported	CHAP, PAP, TACACS	CHAP, PAP	CHAP, PAP, TACACS	CHAP, PAP, Node ID	CHAP, PAP	CHAP, PAP	None
Management							
SNMP support	■	■	■	■	■	■	■
Automatic reset of locked ports	■	■	■	■	■	■	■
Event report of log-ons/failed log-ons	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Individual port configuration/statistics	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Automatic reconnection/session resume	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■
Warns user before executing remote application	■	■	■	■	■	■ (Windows only)	■

N/A*—Not applicable. The product is software only. It comes with a license for eight ports. N/A**—Not applicable. The product is software only.
 1 The tested version of Stampede Remote Office Communications Server includes an optional four-port ISA Digiboard adapter.

The client—Remote Office Gold, Version 2.0—is one of the most comprehensive and intuitive packages among the products we reviewed. Installation was very clean, largely because Stampede bundles Novell's NetWare stack and VLM shell. The Windows version is especially helpful: It includes a NetWare icon to launch Novell's NetWare Tools for

Windows. The software simulates connect, send, and receive lights, which is

SUITABILITY TO TASK		
Remote Office Communications Server		
	Power	Ease
Installation and configuration	Excellent	Good
Management and security	Excellent	Good
Remote-client access	Excellent	Excellent

helpful when monitoring the status of internal modems.

Remote Office also includes RCHost, a surprisingly simple remote-control package for controlling DOS and Windows PCs remotely over a dial-up or LAN connection. Developed by Funk Software, RCHost sets up on the remote client and the LAN-based host in min-

RAD MBE-RAS	Shiva LanRover/E PLUS 3.5	Stampede Remote Office Communi- cations Server	Telebit NetBlazer PN4DE	3Com Access- Builder 2000	Xylogics Remote Annex 2000
\$3,000	\$4,999	\$1,295 ¹	\$2,699	\$2,795	\$3,595
4	4	4 ¹	4	4	8
					
2 x 19 X 12	2 x 17 X 10	N/A**	2 x 9 x 13	2 x 17 x 12	3 x 13 x 10
40	3.5	N/A**	3	5	0813
		N/A**			
115.2 Kbps	115.2 Kbps	N/A**	115.2 Kbps	115.2 Kbps	115.2 Kbps
Ethernet (AUI, BNC, RJ-45), Token-Ring	Ethernet (AUI, BNC, RJ-45), Token-Ring	N/A**	Ethernet (AUI, BNC)	Ethernet (AUI, BNC, RJ-45)	Ethernet (AUI, BNC, RJ-45)
					
					
					(IP and IPX only)
LAN RAnger MBE-PC/A 4.1	ShivaRemote 3.5	Remote Office Gold 2.0	PPP Shell 2.3	Access Builder Client 5.02	Fastlink II 1.19
17K	34K	30K	52K-54K	55K-87K	40K
					
					
					
					
					
					
					
					
					
					
					
					

utes. The client software provides decent performance with no painfully slow redraws.

Installing the communication software on the server is about as simple as on the client; server management is also suitable but basic. Audit logs that track usage by port can be organized chronologically or by user. Like Attachmate's RLN Turnkey

Server, Remote Office lets you share a log among many servers and check the health by port of the system from a single log.

The intuitive Remote Office makes it simple for users to adapt to the often confusing remote-node world. Using your own hardware gives you the flexibility to use older, slower PCs. And with its decent performance, this is a good all-

around pick for user-oriented remote access.

Remote Office Communications Server. *List price: With 4-port ISA DigiBoard, \$1,295. Stampede Technologies Inc., 78 Macro Ln., Dayton, OH 45458; 800-763-3423, 513-291-5035; fax, 513-291-5040; e-mail, sales@stampede.com.*

Circle 519 on reader service card

Telebit Corp.

NetBlazer PN4DE

By TONY POMPILI

The NetBlazer PN4DE's roots as a router show: It does not include remote-client software; it also has an awkward design and uses dated server management software—making the NetBlazer more difficult to set up and use than many other products we looked at.

Although it supports PC, Unix, and Macintosh client protocols, no client software comes with the product. You can use either a third-party PPP application or re-

SUITABILITY TO TASK

NUMBER ONE

	Power	Ease
Installation and configuration	Fair	Poor
Management and security	Poor	Poor
Remote-client access	Fair	Poor

quest Telebit's PPP Client. Telebit's DOS-only client is simple to install, but with no Windows client, you must exit Windows to initiate or break a connection—an inconvenience. To use the client, you must create a batch file to make a connection and specify the script name, file-server name, and type of network driver you're using.

Setup is difficult. The NetBlazer supports four modems, but there are only two DB-25 connectors, so you must multiplex one port into three serial lines. The NetBlazer system software and configuration files load from a floppy disk. This is slow and outdated but makes setting up extra units a matter of just copying the disk.

There are two ways to set up the NetBlazer: from a terminal or PC running communication software connected to the NetBlazer, or via telnet from an IP workstation. A Windows-based configuration program is available on request.

Choosing a modem is an adventure in idiocy. You need to find modem names in

THE COMPAQ CONTURA AERO. Now At \$1,199.



Full Color. Reduced Price.

**CONTURA AERO
FEATURES:**
ONLY 4.2 LBS.
—
486SX/33 PROCESSOR
—
4 MB RAM
(EXPANDABLE TO 12 MB)
—
250 MB HARD DRIVE
—
3.5" EXTERNAL DISKETTE DRIVE
—
PCMCIA Type II SLOT
—
7.8" COLOR BACKLIT
STN VGA DISPLAY
—
INTEGRATED COMPAQ
EASYPOINT™ TRACKBALL
—
NiMH BATTERY PACK
AND AC ADAPTER
—
WINLINK FILE TRANSFER
UTILITY WITH CABLE
—
PREINSTALLED MS DOS®
MS WINDOWS® TABWORKS®
& LOTUS ORGANIZER
—
3 YEAR WORLDWIDE
LIMITED WARRANTY*

The Compaq® Contura® Aero™ is every-
thing a great 486 color notebook should

CONTURA AERO OPTION PAQ
COMPAQ 192 PCMCIA FAX MODEM
ENHANCED NiMH BATTERY PACK
CARRYING CASE
ADD \$279*

and 1.7" high. It's also very light, a
mere 4.2 lbs.

But most importantly, the Contura
Aero is an incredibly full-featured and
useful working tool. It comes with
4MB RAM, a color backlit STN VGA

be. First of
all, it's quite
small. Only
10.25" wide,
7.5" deep,

display, an external diskette drive,
integrated trackball, preinstalled
software, and more.

For added flexibility, consider the
Contura Aero Option Paq™ which
comes with an additional battery pack,
a PCMCIA fax modem, and a handy
carrying case.

At last. A Compaq
quality 486 color
notebook PC with
a price proportional
to its size.

CONTURA AERO
UPGRADES & OPTIONS
—
ADDITIONAL
4 MB RAM (8 MB TOTAL)
ADD \$195
—
CONVENIENCE BASE
ADD \$39
—
COMPAQ 288 PCMCIA
FAX MODEM
ADD \$359

COMPAQ
DirectPlus



1-800-888-6052

WEEKDAYS 7-7, SAT. 9-3 CST

ASK FOR OUR NEW FREE CATALOG.
OR FOR THE NAME OF YOUR NEAREST COMPAQ AUTHORIZED RESELLER, CALL 1-800-345-1518

*Contura Aero Option Paq available through Compaq DirectPlus. Reseller prices may vary. †Restrictions and exclusions apply. Compaq Aero is covered by a Three-Year Worldwide Limited Warranty. Battery packs and certain options are covered by a One-Year Warranty. © 1995 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. DirectPlus is a registered service mark of Compaq Computer Corporation. Contura is a registered trademark, Aero and EasyPoint are trademarks and Option Paq is a service mark of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft, MS-DOS and Windows are registered trademarks of Microsoft Corporation. TabWorks is a registered trademark of Xerox Corporation. Offer available in the U.S. only.



The NetBlazer's two 25-pin D-connectors require an array of cables to install the modems properly.

a file called MODEMCAP.TXT, and if the modems you have aren't listed, you must download other modem definition scripts from Telebit's bulletin board.

Telebit says new client and IPX-based management software will be available by the time you read this. But with the NetBlazer's difficult, limited configuration and management and poor modem support, we cannot recommend it at this time. **NetBlazer PN4DE.** List price: With support for 4 modems, \$2,999. Telebit Corp., One Executive Dr., Chelmsford, MA 01824; 800-835-3248, 508-441-2181; fax, 508-441-9060; e-mail, info@telebit.com.

Circle 520 on reader service card

3Com Corp.

AccessBuilder 2000

BY PADRAIC BOYLE

If you're in the market for a fast and easy-to-use remote-node server, take a look at 3Com Corp.'s AccessBuilder 2000. The AccessBuilder, moderately priced at \$2,795 for four ports, is one of the easiest remote-access solutions in this roundup to install. But with no Token-Ring support or dial-out capabilities, it may not meet some users' needs.

The rack-mountable AccessBuilder

ured itself to our NetWare network. It supports multiple protocols, but only over Ethernet. (3Com's 16-port AccessBuilder 4000 supports both Ethernet and Token-Ring.)

3Com's Windows-based Transcend AccessBuilder management software can access NetWare 3.x's Bindery and NetWare 4.x's NetWare Directory Services (NDS), similar to Xylogics' configuration software. This eliminates the need to input user names manually—especially welcome for a large number of remote-access users.

Transcend is SNMP-compliant and provides excellent in-band management via IPX or IP. You can view a user's current status, port errors, or length of connection. Out-of-band management is also available via a terminal or a telnet session.

The AccessBuilder was also one of the fastest servers

uses a RISC processor. For some reason, the 10Base-T connection is on the front panel—cumbersome if there are several units mounted in a rack.

Installation was very easy. The unit is IPX-enabled out of the box, so it automatically config-

in this roundup, sharing top honors with Shiva's LanRover/E PLUS.

Client software installation was uncomplicated, and using it was not problematic or especially noteworthy. As with Cayman's Gator Access MP, to install the DOS client, you must install the Windows version and copy the necessary DOS files.

As part of 3Com's SuperStack Solution (which allows you to connect multiple 3Com products), the AccessBuilder

SUITABILITY TO TASK

AccessBuilder 2000

	Power	Ease
Installation and configuration	Excellent	Excellent
Management and security	Good	Good
Remote-client access	Good	Good

provides an optional secondary power-supply connection—a feature not found in any other product in this roundup.

For speed and ease of use, the AccessBuilder is second only to Shiva's LanRover/E and costs little more than half the price. But if you need Token-Ring or dial-out support, look elsewhere.

AccessBuilder 2000. List price: With 4



3Com's Access Builder 2000 includes a 10Base-T Ethernet connection on the front panel.

Smart, Simple Printer Sharing

- Connects from 3 to 32 computers and printers
- DOS/Windows compatible
- High speed and error free even at 1200'
- No software changes required
- Simple installation. Just plug SmartPrint modules into your computer and printer parallel ports and snap in the supplied wires. That's it!

Questions?

Call us at 1-800-368-7737
(Outside US/Canada 909-945-5600)
or for instant info by fax call 24 hrs
1-800-373-3600 and ask for #1012

SmartPrint™
Printer Sharing Network

Order from any computer dealer. Distributed to dealers by Ingram Micro and Tech Data.
Made in USA by Dresselhaus
GSA Scheduled • 3 year warranty

BONUS
File transfer software
FREE

	Part Number	Suggested Retail
Starter Kit for 2 computers/1 printer	PSN1	\$ 199
Add-on Computer Module	PSN2	59
Add-on Printer Module	PSN3	69

Now Everyone Can Have The Superior Monitor.



If you've always wanted a top performing monitor, now is the time.

Even the coolest dudes find Nanao's new 17" monitors irresistible. Our new T2-17TS and F2-17EX monitors can't be beat for graphics quality. Which is why they're setting sales records at computer stores. Users are also drawn by Nanao's reputation for quality plus a stunning new array of advanced technical features that are ideally suited for the graphics environment. Nanao even offers a choice of 17" models to satisfy your individual preference. Our FlexScan T2-17TS has an advanced Aperture Grill tube, while the F2-17EX features a flat-screen

Invar Shadow Mask tube. Both monitors provide the power you really need to achieve true-to-life colors, crisp typography and a stable screen image. Ultra high 1280 x 1024 resolution at 82Hz refresh rate, Colorific™ color management software and on-screen image controls deliver a new level of graphics performance. For added safety against radiation emissions, TCO compliance is now available as a standard feature. And each monitor supports Windows '95 Plug & Play,* so you'll be in tune with the latest wave of technology.

If you're wondering why this dude looks so satisfied, it's easy to figure out. He just caught the perfect wave. And the perfect 17" monitor.

F2-17EX
 Dot Pitch 0.26mm
 Actual Viewing Diag. 16.1"
 Scan Freq. H:30-86kHz, V:55-160Hz
 Res. Resol. 1280 x 1024 @ up to 82Hz
 Max Resol. 1600 x 1200 @ up to 66Hz
 On Screen Control ScreenManager™ and ScreenManager™ Pro
 Standards MPR-II, TCO

T2-17TS
 Aperture Grill 0.25mm
 Actual Viewing Diag. 16.0"
 Scan Freq. H:30-86kHz, V:55-160Hz
 Res. Resol. 1280 x 1024 @ up to 82Hz
 Max Resol. 1600 x 1200 @ up to 66Hz
 On Screen Control ScreenManager™ and ScreenManager™ Pro
 Standards MPR-II, TCO

3-year warranty**



**Special Savings On F2-17EX & ATI GPT Card Bundle!
 Limited Time Offer. Call Your Reseller For Details.**

CALL OUR FLEXFAX FAX ON DEMAND 1-800-416-FLEX

*Requires a DDC compatible video card. And, Nanao adapter (available as an option). **3 year on P & L and CRT. Superior In Every Detail is a registered trademark of Nanao Corporation. All product names are trademarks of their respective companies. ©1995 Nanao USA Corporation.

NANAO®

Superior In Every Detail

NANAO USA CORPORATION
 23535 Telo Avenue, Torrance, CA 90505
 (310) 325-5202 Fax: (310) 530-1679

1-800-800-5202

Remote-Node Servers

ports, \$2,795. 3Com Corp., 5400 Bayfront Plaza, Santa Clara, CA 95052-8145; 800-638-3266, 408-764-5000.

Circle 521 on reader service card

Xylogics Inc.

Remote Annex 2000

BY PADRAIC BOYLE

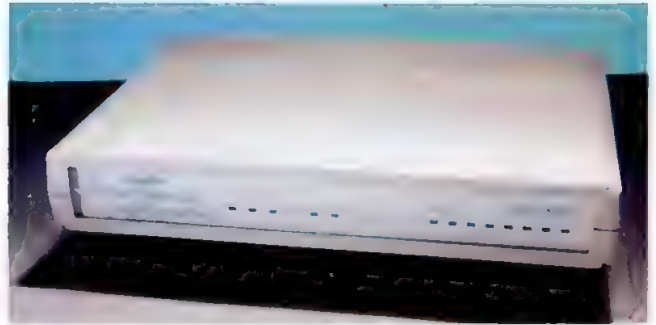
It may not be pretty to set up, but Xylogics' Remote Annex 2000 provides a flexible, multiprotocol remote solution. One of the best performers on our Scalability tests, the \$3,595 Remote Annex offers eight ports at a reasonable price. But the unit is not easy to install, and its utilities require a knowledge of Unix.

Installing the Remote Annex required some extra effort. We had to configure the box via a command line interface from Windows' Terminal and then reboot for the configuration to take effect. Instead of se-

rial ports, the unit has eight RJ-45 ports, which means you have to buy special cables to connect the modems.

Bringing up the unit either in multiprotocol mode or in NetWare-only mode, depending on your configuration, adds flexibility but also more complexity. The Remote Annex loads a boot image in one of three ways: from the unit itself, from a Unix host, or from an assigned NetWare server (in NetWare-only mode).

The DOS and Windows Fastlink II client was easy to install and required little change to the PC's configuration files. The DOS client uses batch files for operation; the Windows interface is easier to use,



Instead of serial ports, Xylogics's Remote Annex 2000 has eight RJ-45 ports that require cable adapters.

with icons for making or breaking a connection, and it works in conjunction with NetWare's Users Tools for log-on. Xylogics also bundles Funk Software's remote-control software, Proxy.

With the Remote Annex, you're a step ahead if you're a Unix shop. As with the Cisco 2509, this unit's more powerful features, such as traffic filtering, are available only from a Unix-based management package. An included DOS-based configuration utility can read NetWare's Bindery for easy configuration—much as

SUITABILITY TO TASK		
Remote Annex 2000		
	Power	Ease
Installation and configuration	Good	Good
Management and security	Excellent	Good
Remote-client access	Good	Good

What Would You Call A \$100 Digital Camera?



Video Magic.

QuickCam™ includes all you need to make movies and take pictures with your PC. Plug one cable into your parallel port, install the software and shoot. It's simple. Make training films, video conference, inventory valuables. It's easy to take pictures, too. Add photos to newsletters, documents, reports. QuickCam comes with Movie AVI for Windows, QuickMovie software, QuickFrame templates and QuickPicture image saver. All for around \$100. Your satisfaction is guaranteed. Buy your QuickCam today wherever fine computer products are sold.





Connectix

System Requirements: A PC equipped with a 386, 486, Pentium or equivalent processor
 • Windows 3.1 or 3.11, Windows for Workgroups 3.1 or 3.11 • 4 MB RAM required








Copyright © 1995 Connectix Corporation, 2700 Legume Way, San Mateo, CA 94403. All rights reserved. Connectix, the Connectix logo, and QuickCam are trademarks of Connectix Corporation. Windows, Windows for Workgroups, and the Windows logo are registered trademarks of Microsoft Corporation. All other trademarks are the property of their respective owners.

CIRCLE 007 ON READER SERVICE CARD

The NLM Option: NetWare Connect and WanderLink

By Padraic Boyle and Tony Pompili

For some network managers, remote-node solutions that integrate with NetWare are sweeter pills to swallow. Novell and Funk Software capitalize on these cravings with NLM-based remote-node servers.

NETWARE CONNECT

The latest beta release of Novell's NetWare Connect (800-638-9273) addresses many of Version 1.0's shortcomings with easier installation, a rich management program, and dial-in and dial-out for DOS, Windows, and Macintosh clients. Pricing was not yet set at press time, but the product should be

available by the time you read this.

Installation is a breeze with modem auto-detection. You can manage multiple NetWare Connect servers from a single console and report on everything from port statistics to on-line charges for connect time. Audit trails offer more information about the connected users, modem speed, and duration of calls.

WANDERLINK

WanderLink 1.0, from Funk Software (800-828-4146), also works with any NetWare server and provides dial-in for DOS and Windows users. There is no Mac or IP support.

WanderLink (\$595 for four ports and unlimited users) is simple to install on the client and server. It includes a single license for DOS and Windows versions of Funk's Proxy, a LAN-based remote-control package. Each additional license costs \$89.

The Windows-based WanderLink Administrator lets you configure ports, modems, and users and also lets you monitor the server status. WanderLink's security is quite strong, offering dial-back, data encryption, and node ID. An optional and extensive group of network filters, called Domains, can restrict access to any part of the network. □

with Shiva's LanRover/E PLUS. Access can be set according to NetWare groups or user names. But to access the features fully, you must use Unix.

The Remote Annex has good features

and excellent performance. Although not as simple to install as some products reviewed here, it may be worth the effort. □

Remote Annex 2000. List price: With 8

ports, \$3,595. *Xylogics Inc., 53 Third Ave., Burlington, MA 01803; 800-892-6639, 617-272-8140; fax, 617-273-5392; e-mail, sales@xylogics.com.*

Circle 522 on reader service card



SUBSCRIPTION SALE

Answers. Advice. Strategies. Solutions.
22 times a year, you get it all
from PC MAGAZINE.

To receive your lowest possible rate,
call toll-free:

1-800-289-0429

BONUS:

Free Home or Office Delivery

Please mention code 4294 to our operator.

User-to-User

BY NEIL J. RUBENKING

Capitalize a String Using FC

When DOS's FC.EXE (file compare) program is used in ways its developer never envisioned, it can perform some unexpected tasks. For example, capitalizing a string is pretty simple using an error-handling quirk of FC. Like many other DOS commands, FC capitalizes the filenames passed to it as arguments and displays the uppercase versions when reporting errors. Unlike most of the others, however, FC permits the error display to be redirected. Thus I was able to create the four-line capitalization batch file shown in Figure 1.

CAP.BAT passes the second command line parameter (%2) to the FC command in a way that ensures a "File(s) not found : ..." error. The error message, with its capitalized version of the input string, is captured in the temporary batch file FILE(\$).BAT. When this file is CALLED, it invokes the other temporary file, FILE(S).BAT, which stores the result in the environment vari-

able named as parameter %1.

There is little error handling in CAP.BAT and no ECHO OFF, because I've assumed the routine will be used only by CALLing it from another batch file. If the second parameter is absent, the variable named in the first parameter will be removed from the environment. The procedure correctly handles strings up to about 116 characters long containing all characters except redirection characters (<, >, and |) and delimiters (space, comma, semicolon, equal, and tab).

You probably noticed the unconventional placement of the output redirection symbol (>) at the beginning of the lines in CAP.BAT. I decided to put them there because I found that DOS doesn't care—and, because you can then easily align the filenames and the executable parts of the lines, it makes debugging much easier.

*Thomas G. Lavedas
Clifton, Virginia*

► **PC MAGAZINE:** As all DOS diehards know, quirks in the DOS utility programs can provide amazing opportunities. In this case, the fact that FC.EXE allows its error messages to be redirect-

ed makes a totally unconventional usage possible. To clarify the mysterious workings of CAP.BAT, we'll follow the execution of the command

```
CALL CAP.BAT PC magazine.
```

The first line of the batch file echoes the string

```
IF NOT [PC]==[] SET PC=%5
```

to the temporary batch file FILE(S).BAT. This temporary file must be named FILE(S).BAT, for reasons we'll see in a moment. The next line calls FC to compare the file &magazine to the NUL device. DOS filenames cannot contain the semicolon character, so that filename will not exist. The output of FC is the error message

```
File(s) not found : &MAGAZINE
```

This message is redirected to the temporary batch file FILE(\$).BAT. This file could have any name; FILE(\$).BAT

```
::      CAP.BAT - A generalized capitalization routine.
::
::      Syntax:
::          CALL CAP VariableName=String
::
> FILE($).BAT ECHO IF NOT [%1]==[] SET %1=%%5
> FILE($).BAT FC &%2 NUL
      CALL FILE($)
      DEL FILE(?) .BAT
```

Figure 1: This tiny batch file capitalizes its second parameter and assigns the result to the environment variable named in the first parameter.

was chosen to make it easy to delete both temporary files with a single command.

The third line CALLs FILE(\$).BAT, whose first and only line executes FILE(S).BAT, passing the five parameters "not", "found", ":", "&", and "MAGAZINE". FILE(S).BAT sets the environment variable PC to the fifth parameter, MAGAZINE. Finally the fourth line of

► IN THIS SECTION

Extending Your Apps 329
Power Programming 403
Utilities 413
Solutions 421

CAP.BAT deletes both temporary files.

Do note that the limit of 116 characters refers to the sum of the lengths of the string to be capitalized and the variable that will hold it. But, since the string cannot contain any spaces, you're not likely to bump into this limitation.

Go "2" Any Directory Fast!

I've used the 2.BAT batch file for years now, ever since it was presented in the issue of June 25, 1991. I love using it for changing directories and drives. But since I enabled 32-bit file access in Windows for Workgroups 3.11, 2.BAT no longer works in DOS sessions under Windows. What happens is that directories that don't exist are reported as existing by the "IF NOT EXIST %1\NUL" test. So I created my own version of the batch file. It works

particular directory without having to type the colon or backslash. I use it dozens of times a day. To go to C:\WINWORD \CLIPART, enter "2 c winword clipart". If you're already on drive C:, "2 winword clipart" does the job. And if you're already in C:\WINWORD, all you need is "2 clipart".

2.BAT can treat the series of directory names on its command line as a path from either the root directory or the current directory. The batch file decides which route to take by testing whether the first directory name is a subdirectory of the current directory. And it makes that determination by testing whether the NUL device exists in a directory with that name. Under plain unadulterated DOS, the test

```
IF EXIST directory\NUL
```

will be true only if the specified directory exists.

```
@ECHO OFF
FOR %%h IN (a A b B c C d D e E f F) DO IF (%1) == (%%h) %%h:
FOR %%k IN (a A b B c C d D e E f F) DO IF (%1) == (%%k) SHIFT
IF NOT EXIST %1\NUL CD \
FOR %%f IN (%1 %2 %3 %4 %5 %6 %7 %8 %9) DO CD %%f
```



Figure 2: Use 2.BAT to navigate quickly between directories without typing the colon or backslash.

```
@ECHO OFF
REM If your last disk drive is less than F:, remove the
REM non-existent letters from the two FOR commands that follow.
REM If your last disk drive is more than F:, add letters
REM as necessary to the two FOR commands that follow.
FOR %%h IN (a A b B c C d D e E f F) DO IF (%1) == (%%h) %%h:
FOR %%k IN (a A b B c C d D e E f F) DO IF (%1) == (%%k) SHIFT
CTTY NUL
REM>%1\$$TEST$$.$$$
CTTY CON
IF NOT EXIST %1\$$TEST$$.$$$ GOTO No
DEL %1\$$TEST$$.$$$
GOTO Change_Dir
:No
CD \
:Change_Dir
FOR %%f IN (%1 %2 %3 %4 %5 %6 %7 %8 %9) DO CD %%f
```



Figure 3: 2NEW.BAT makes 2.BAT's functionality available on systems that don't support the usual DOS test for existence of a directory.

around the false positive IF EXIST result by creating a zero-length file, then uses this instead of the NUL device for the test. However, my version can't deal with parent directory notation (..) or root directory notation (\) without further modification.

Steve Peplinski
Pulaski, Washington

►PC MAGAZINE: The original 2.BAT (Figure 2) was created to let you get "2" a par-

Unfortunately, this test is ineffective under several variations on DOS. If you use DR-DOS 6.x or any of several network operating systems, the test returns true even when the directory doesn't exist. Apparently the same is true of DOS boxes under Windows for Workgroups when 32-bit file access is enabled.

The version of 2.BAT shown in Figure 3 doesn't have this limitation because it tests for the existence of an ac-

tual file. And I modified Mr. Peplinski's version a bit to avoid the problems he noted with parent directories and root directories. You can go from the directory C:\ACCT\1994 to C:\ACCT\1995 with the command "2 .. 1995", for example. If the original 2.BAT works for you, all the better. If not, give the new version a try!

You can download these batch files from PC MagNet's Utilities/Tips Forum archived as 2NEW.ZIP.

Capturing Full Screens with Paintbrush

Your informative article on the Windows help system (Extending Your Apps, December 20, 1994) offered a technique for capturing program screens using Paintbrush. Here's a simpler method: To save images that exceed the size of the Paintbrush editing window, just paste the image (Ctrl-V) into Paintbrush and then (before doing anything else) choose Edit | Copy To. You are prompted for a filename (and you can select a different file format as well), and the total image will be saved.

Karsten Tanggaard
Copenhagen, Denmark

►PC MAGAZINE: If the virtue of this technique isn't clear to you, try this exercise. Press PrtSc to copy the entire screen to the Clipboard. Start Paintbrush and press Ctrl-V, or select Paste from the Edit menu. Choose Save As... from the File menu and save the file as GETRID1.BMP. Now open a new file and paste the Clipboard into Paintbrush again. This time choose Copy To... from the Edit menu and copy the image to GETRID2.BMP.

The two resulting files are the same size, but the first contains only the part of the image that was visible in the Paintbrush editing window. To see this, maximize Paintbrush and load GETRID1.BMP. Then press Ctrl-P to view the picture full-screen. You'll see that it's cut off at the right and bottom. Do the same with GETRID2.BMP and it fills the entire screen! □

Extending Your Apps

BY M. DAVID STONE

Setting Up a Small-Office Invoicing System

Billing can present a real problem for the small, service-oriented business. If you're successful enough to stay in business, you're likely to have too many invoices and outstanding receivables to track conveniently by hand, but nowhere near enough to justify buying a full-scale invoicing program. And inexpensive programs meant for small businesses often lock you into an invoice format more appropriate for billing goods than services.

Fortunately, a solution is at hand. You can easily set up your own small-office invoicing system by combining a spreadsheet or database program to keep track of receivables with Word for Windows, Version 6.0 to print the invoices. For purposes of this article, I'll use Excel, Version 5.0 to track receivables, but you can use any spreadsheet or database program that stores its information in a format that WinWord's mail-merge feature can read.

The complete invoicing system described here consists of OUTSTAND.XLW, an Excel 5.0 workbook, and two WinWord templates, BILLSVC.DOT and BILLEXP.DOT. You can get copies of all three files (plus one variation of OUTSTAND.XLW and BILLSVC.DOT) by downloading INVOI.ZIP from PC Magazine's Programming Forum on PC MagNet. Use the primary versions of these two files if you don't add sales tax to your charges. If you do add sales tax, use the variants OUTSTANT.XLW and BILLSVCT.DOT.

I'll assume you're familiar with the basics of both Excel and WinWord. You should, for example, know how to format text in both programs, adjust column widths in and change the names of individual worksheets in Excel, and so forth. I won't assume, however, that you know how to use WinWord's mail-merge feature to set up a template for mail-merging. To use the Excel workbook, you need to be familiar only with the basics of entering text in Excel and navigating through its worksheets. To use the WinWord templates, you need to know only the basics of entering and editing text, choosing the right template when creating a new file, and using the Mail Merge toolbar, which I'll discuss here.

SETTING UP THE FILES Setting up the files for invoicing requires some forethought and preparation. Once you've downloaded and unzipped the files, copy OUTSTAND.XLW (or, if you add sales tax, OUTSTANT.XLW) to any convenient Excel data directory. Then copy the two WinWord templates, BILLEXP.DOT and BILLSVC.DOT (BILLSVCT.DOT if you add sales tax), to the WinWord template directory. If you haven't changed the WinWord defaults since installation, this will be the WINWORD directory, though many users change the setting to the WINWORD\TEMPLATE directory, which is where Word puts all its sample templates during installation.

If you have any doubts about the current setting for the template directory, you can choose Tools | Options, then File Locations, and note (or change) the set-

tings for User Templates and Workgroup Templates. Then copy the two templates to either location. To confirm that you've copied them to the right directory, choose File | New and make sure the two choices Billexp and Billsvc (or Billsvct) show up in the New dialog box on the list of templates.

The next step is to set up your Excel workbook. If you load Excel and open OUTSTAND.XLW or OUTSTANT.XLW, you'll see a workbook with six worksheets. The first sheet on the left is a summary sheet, which is described below. The next three sheets, Client 1, Client 2, and Client 3, are for individual clients who generate enough billing so that you want to track their bills separately. The fifth sheet, Other Clients, is identical to the Client worksheets except that it's meant for minor clients who don't generate enough billing to warrant tracking them separately. The sixth sheet, Client Form, is a template you can copy to new worksheets to create additional client worksheets.

BEFORE YOU GET STARTED A little thought at this point will save a lot of work later. First consider which clients to track separately rather than in a worksheet with other customers. Generally, unless you are generating several bills for

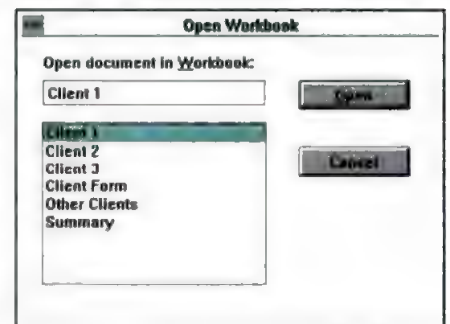


Figure 1: When you create a new document based on one of the billing templates, WinWord will ask you which of the workbook worksheets you want to use.

a given client during each billing session, tracking the clients separately is probably more bother than it's worth. If you don't have any clients in this category, delete the summary sheet and the Client 1, Client 2, and Client 3 worksheets. Keep the Client Form sheet, however; you may need it later.

If you do have any clients you want to

track separately, you'll need a separate worksheet for each one. You can create additional worksheets if you need more than the three included. Don't forget to take into account the issue of sales tax.

The worksheets in OUTSTANT.XLW assume that your services do not need to include a sales tax. The columns are: Inv No, Inv Date, To Who, Project, Amount, Date Mailed, Outstanding, and

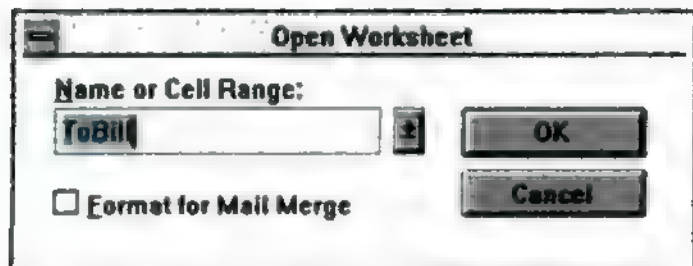


Figure 2: After specifying which worksheet to use for creating an invoice, you select ToBill when WinWord asks for a Name or Cell Range.

Date Paid. (Yes, we know that grammatically this should be *to whom*, but, after all, this is just a field name.) The formula in the Outstanding column (column G) is:

`=IF(Hx="",Ex,0)`

where *x* is the number of the current row. This formula tells Excel that if column H (Date Paid) has no entry in the current row, the Outstanding value should equal the value in column E (Amount) in this row. But if there is an entry in the Date Paid column—meaning the bill has been paid—the value for the cell in the Outstanding column should be zero. (I'll discuss how to handle partial payments later.)

The worksheets in OUTSTANT.XLW are similar, but they include a column for sales tax between the Amount and Date Mailed columns. The formula in the Outstanding column (column H) becomes:

`=IF(Ix="",Ex+Fx,0)`

This is essentially the same as for OUTSTANT.XLW, except that if the Date Paid column (which is moved to column I) has no entry, the entry for the outstanding amount equals the Amount (column E) plus Sales Tax (column F).

If you're using OUTSTANT.XLW, you'll have to add the actual rate of the sales tax. In each client sheet, add the formula in F4 to calculate the tax. If the sales tax is 8 percent, for example, the formula

in F4 would be:

`=E4*0.08`

Then copy the formula to cells F5 through F55. (The entries in the worksheet stop at row 55 so you can print it on a single page, but you can extend the formulas to as many rows as you like.)

ADDING NEW CLIENTS Once you've taken any necessary sales tax into account, you can use the Insert Worksheet command to add as many additional sheets as you need, and then copy the Client Form to each new worksheet.

To copy the Client Form, highlight the entire Client Form worksheet (click on the rectangle at the intersection of the row and column headings) and copy it to the clipboard. Then go to each new sheet in turn, select cell A1, and press either Shift-Ins or Ctrl-V, or choose Edit | Paste. (You could, of course, paste by simply hitting Enter, but then you'd have to go back to Client Form and copy the worksheet to the clipboard again.)

To finish preparing each new client worksheet, rename it with the client name. Then type the client name in cell A1 and enter an appropriate starting invoice number in cell A4. In the downloadable files, the workbook uses 101001 for Client 1, 201001 for Client 2, 301001 for Client 3, and 401001 for Other Clients. Giving each client sheet its own series of numbers lets you use worksheet formulas to number the invoices automatically. It also lets you use the first numbers in each invoice to identify the client.

For the finishing touch, go to the summary sheet, which shows the names of each client sheet in column A and the total amount outstanding on that worksheet in column B. If you didn't add or delete any client worksheets, you need only change the names to match the actual names of your worksheets. If you deleted any sheets, you should delete the rows that match the deleted sheets and rename the remaining entries. If you added any sheets, you'll need to add entries for those sheets as well as rename the original en-

tries to match the sheet names.

Entering the names for each new sheet in column A is easy. The format for the formulas in column B is:

`=Name of Client Sheet'!$E$1`

where Name of Client Sheet matches whatever name shows on the tab for that sheet. You follow the same procedure whenever you add new clients, adding a new client sheet and then an entry for that sheet on the summary sheet.

TESTING THE WORKBOOK At this point, you should enter some real or test data into the client sheets to make sure everything is working properly. The invoice numbers should increment automatically. The invoice date, date mailed, and date paid should all automatically follow the format D/M/YY even if you enter only the day and month. Entries in the To Who and Project columns should automatically wrap if they're too large to fit on one line. And entries in the Amount column—and Sales Tax column if you're using OUTSTANT.XLW—should automatically format as currency, with two

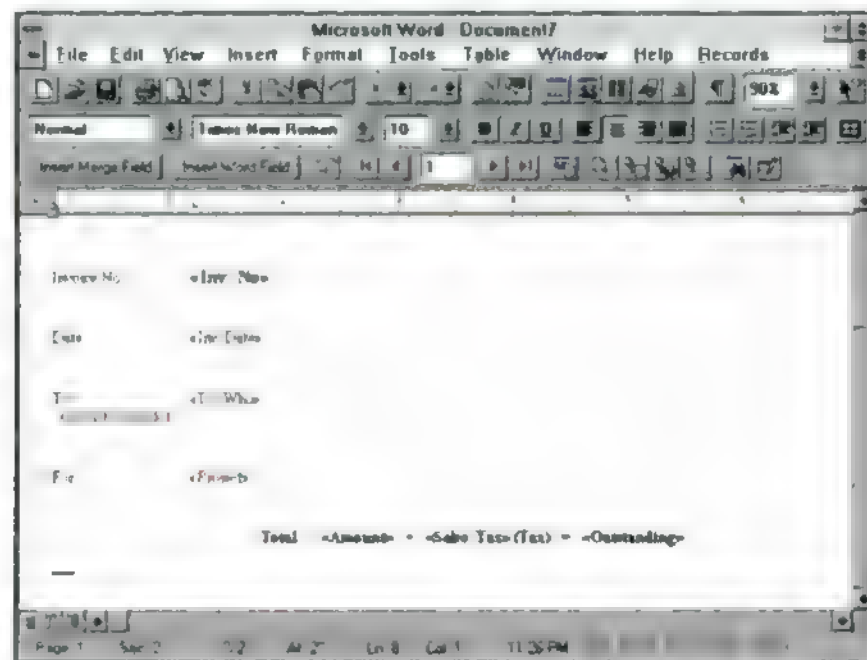


Figure 3: When working with a document based on the billing templates, you can toggle between the field names, as shown here, and the actual data for the current record. Keyboard users should note the custom menu Records to the right of the Help menu.

decimal places.

Most important, any entry in the Amount column should also show up in the Outstanding column. But if you enter anything in the Date Paid column, the Outstanding column should automatically change to zero. If you're using OUTSTANT.XLW, the tax should automatically show up when you enter the amount,

Continued on page 400

PRODUCTS PREVIEW '95



GRAPHICS

BACKUPS

POWER SUPPLIES

SPREADSHEETS

MULTIMEDIA

PUBLISHING

WORD PROCESSING

ACCESSORIES

COMMUNICATIONS

PRINTERS

PERIPHERALS

GRAPHICS

PROGRAMS

UTILITIES

PERIPHERALS

PUBLISHING

WORD PROCESSING

LASER PRINTERS

STORAGE MONITORS

CD-ROMS

SOFTWARE

UTILITIES

POWER SUPPLIES

NOTES/BOOKS

NETS

Click. Pop!



Log onto Internet
Get Mail

Read My Newsgroups

World Wide Web
Search FTP Sites
Log Off

It's instant gratification.

You click once and a pop-up menu appears. In it are the Internet commands you use most often. You click again and the command you choose is executed.

You log off the Internet. You move into your fax program. You click the same button and another pop-up menu appears. But this time it's a different menu. With the fax commands you use most often.

Instant gratification has a name. Two names really. Thinking Mouse™ and Expert Mouse® from Kensington.

These are no ordinary mice. They're *programmable* mice. What's

more, you don't have to be a programmer to use them.

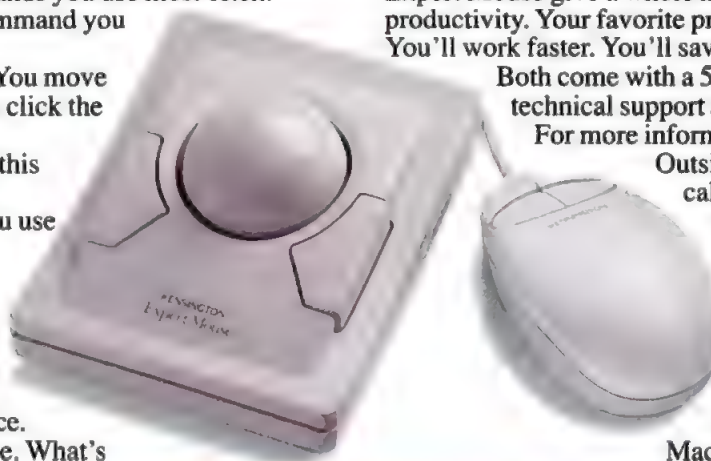
Easy-to-program, easy-to-use, Thinking Mouse and Expert Mouse give a whole new meaning to the word productivity. Your favorite programs will run better. You'll work faster. You'll save valuable time.

Both come with a 5-year warranty, toll-free technical support and a no-risk 90-day trial.

For more information, call 800-535-4242.

Outside the US and Canada, call 415-572-2700. For information by fax, call and request document number 351.

Includes software for Windows, OS/2 and DOS. 100% Microsoft compatible. Available in Serial & PS/2, Bus and Macintosh versions.



KENSINGTON



Thinking Mouse is a trademark and Expert Mouse and Kensington are registered trademarks of Kensington Microware Limited. All other registered and unregistered trademarks are the sole property of their respective owners. © 1995 Kensington Microware Limited 395

CIRCLE 284 ON READER SERVICE CARD

**RISK FREE
OFFER!**

How Do Millions of Windows™ Users Protect Their Most Valuable Asset?



"RESCUE works miracles." — InfoWorld

Be Prepared...

When disaster strikes reach for **RESCUE**, the best selling data recovery software for Windows and DOS users. **RESCUE** is so simple to use, by just pressing a few keys or with a click of a mouse, *anyone* can start recovering their own data in a matter of minutes.

Your Insurance Against Data Loss

Nothing can stop your hard drive from crashing when its time is due, but **RESCUE**, like an insurance policy, gives you the *peace of mind* and *security* of knowing your data is safe and available when you need it.

Prevent Lost Time, Lost Work

Recreating your lost work from scratch can take a long time, and it can be frustrating and very costly.

Instead of agonizing for countless hours in front of your computer, let **RESCUE** do the work for you and recover all your Windows and DOS files including files from compressed drives.

Full Data Protection Kit

New version also includes: Full protection from over 5000 deadly viruses; voted PC World's Best Anti-Virus Program • Premium back-up utility that backs up your data every day, automatically.

RISK-FREE

90 Day Money-Back Guarantee!

Only \$~~99~~

CALL NOW FOR PRICING!

(800) 653-4933 PMA

Int'l. (813) 539-7283 • Fax (813) 531-0200

BBS: 813-535-9042 • Internet: ALLMICRO@IX.NETCOM.COM

RESCUE is available from resellers nationwide
Call (800) 653-4933 for the outlet nearest you.

AllMicro, Inc.

18820 U.S. Hwy. 19 N., #215, Clearwater, Florida 34624

Offer subject to change without notice. 90 Day Money-Back Guarantee offered by AllMicro for direct purchases, reseller selling policies may vary

Fix Any PC...FAST!

PC DIAGNOSTICS THAT REALLY FINDS THE BUGS!



The Troubleshooter™ is the most advanced PC diagnostic software available. It bypasses DOS & tests all major hardware components directly for true accuracy. Works with Windows, Windows NT, Windows 95, Novell, MS Dos, OS2, etc.

— fully O/S independent. Loaded with all the tests you'll need to accurately isolate the source of any PC failure. Call now for full list of latest features!

NEW UPGRADED VERSION!

#1 WINDOWS TROUBLESHOOTING TOOL!



Skylight™ is the #1 rated Windows diagnostic (PC Magazine) that tunes, optimizes & troubleshoots Windows for maximum speed and performance. Edits all .INI files safely. Graphically displays how Windows is using memory, system resources, plus

much more with hundreds of reports! A must for all Windows users! Call now for full list of features!



RESOLVE ANY IRQ OR DMA CONFLICT...100%



The Discovery Card™ is the first tool to accurately resolve any IRQ or DMA conflict. 18 L.E.D. lights (11 for all interrupts and 7 for all DMA) immediately report actual usage thus saving time when configuring, upgrading or debugging PC's. Call now, save time and end the frustration!

Winner 1995 Top Diagnostic Tool • Windows Magazine

WINDOWS 1995 WIN 100

VITAL HARDWARE SPECS AT YOUR FINGERTIPS!



The Micro House Technical Library™ on CD-ROM is compiled from over 50,000 pages of technical hardware manuals! Contains complete configurations, specifications, diagrams, settings, component locations etc. all at your fingertips. Includes main boards, network inter-

face cards, hard drives, controller and I/O cards. A must for any service department. Call today for special pricing!

CIRCLE 289 ON READER SERVICE CARD

FIX OR INSTALL ANY HARD DRIVE...FAST!



DrivePro™ provides fast, precise installation and maintenance for any hard drive. Override BIOS limitations for user-definable drive types. Format any size hard drive in under 30 seconds. Install IDE hard drives in less than 60

seconds. Allows the use of IDE drives with MFM/RL or ESDI drives in the same system. Retrieves the manufacturers' recommended specs from the drive itself, plus much more! Call now for full list of features!

**Free Technical Support
Next Day Shipping
Performance Guaranteed**

(800) 653-4933 PMB



Int'l. (813) 539-7283 • Fax (813) 531-0200
BBS: 813-535-9042 • Internet: ALLMICRO@IX.NETCOM.COM

AllMicro, Inc.

18820 U.S. Hwy. 19 N., #215, Clearwater, Florida 34624

©1995 AllMicro, Inc. The Troubleshooter, Skylight, The Discovery Card are trademarks of AllMicro, Inc. All Rights Reserved. Other names are trademarks of their associated owners. Specifications subject to change without notice.

OVER FORTY MEGABYTES OF WINDOWS 95 WILL SOON LUMBER INTO YOUR HARD DISK.

MAKE ROOM.

You can spend \$2,995 and buy a new computer with a humongous hard disk. Or you can spend \$29.95 and clean up the one you have. Rid it surgically and safely of unwanted or duplicate files and programs. Quarterdeck CleanSweep™ will work with Windows 3.1 and Windows 95 to find all the megs you want and more in a jiffy. Call (800) 354-3222 or your nearest retailer and brace yourself.

©1995 Quarterdeck Corporation. Quarterdeck is a registered trademark. CleanSweep is a trademark of Quarterdeck Corporation. All other trademarks are properties of their respective owners.

Free

Personal Inventory Manager™



**Will you know what you had when it's gone?
Could you prove it?**

Finally, Personal Inventory Software That Is Quick, Easy, And Fun.

Armed only with a mouse and Fusion Software's **Proof**, you can capture the contents of your home or office, and it's quick, easy, and fun. Now you can have the peace of mind you have always wanted, knowing that you are properly insured. And filing an insurance claim with **Proof** is as easy as clicking a mouse button.

What used to be a boring, tedious, text operation with a database, word processor, or spreadsheet, is now fun, easy, and graphical with **Proof**. If you can drag and drop an icon, you can create a list of the contents of your home or office. It's that simple!

Proof does it all!

- Provides a complete record
- Contents selection, sorting, and reporting.
- Prints claim forms
- Settlement tracking

A Personal Inventory Manager That Has Expert Insurance Advice.

Over 600 colorful icons to help you identify rooms and items in your home or office. You may enter as little or as much information about each item as desired. You can even assign an heir. **Proof** will help you by highlighting insurance company requirements.

To prove how important we think your records are we are giving away thousands of copies. But you have to act fast. Order your **FREE*** version of our \$99.99 Proof now.

All mail-in orders postmarked on or before Nov. 1, 1995 are guaranteed to ship for the shipping and handling charge only.

ORDER TODAY!

800-856-8566

713-465-6363 (Houston)

713-465-9749 (fax)

Mail: Fusion Software
9337-B Katy Frwy, Ste PC508
Houston, TX 77024

TX residents add 8.25% sales tax



*There is a \$9.95 nonrefundable shipping and handling charge. Have your Amex, Mastercard, Visa or Discover card ready. One copy per household. Canada add \$3, other countries add \$22. IBM PC or compatible, running Windows 3.1, VGA or better, mouse or compatible device, and minimum 4MB ram required. Fusion Software reserves the right to end this offer at any time. © Fusion Software, Inc., Houston, TX 77024. Proof is a trademark of Fusion Software. Windows is a trademark of Microsoft® Corporation.

fusion
software

PC508

Introducing

THE DYNAMIC DUO



POW
PENTIUM®
POWER

BIT
UP TO
40MB RAM

BOOM
TRUE
MULTIMEDIA



STARTING AT
\$3749

Before Market Color - Pentium® 75 Processor
38MB RAM and a 340MB Hard Drive
(Windows 95® Included)

Power CD 8300

- Internal 5.25" Double Speed CD ROM
- Choice of Intel 3.3v Pentium® Processors
- 10.4" or 11.3" Dual-Scan Color or Active Matrix Color Displays
- 16-bit Stereo Sound
- Advanced PCI Local Bus Interface
- Built-In TouchPad
- PCMCIA (PC Card) Type III
- Removable Hard Drive (340MB to 1 GigaByte)
- 8MB RAM expandable to 40MB
- Built-In SIM Infrared Interface
- Built-In 1.44MB Floppy Drive
- Ports: 1X, 1P, 1VGA, 1 Keyboard, Modem & 2 Audio In/Out
- 1 MB VRAM, Upgradable to 2 MB
- Over 3 Hours of Battery Life
- Optional MPEG Module
- Includes MS DOS & Windows 95®, NMMH Battery & Carrying Case
- Optional Port Replicator or Multimedia Docking Station

High above the cities where justice is long overdue, lies a new force, ready to offer it's services to all those who want good over evil. The **AMS Power CD** has it all to process the most difficult applications **Windows 95** has to offer, quickly, and effortlessly. Built for speed and powered to drive the advanced features **Windows 95** demands, this dynamic team will take you where no restrictions apply. Beware those who oppose change, the **Dynamic Duo** has now arrived.



Money Back Guarantee
If for any reason you are not completely satisfied with your AMS Notebook Computer, just return it within 30 days and we will promptly refund your money**



Lifetime Toll Free Technical Support
Your use of the computer doesn't stop after your warranty expires and neither should your support. We're there to assist you, toll-free, for as long as you own your AMS computer.



24 Hour BBS
No matter where you are, no matter the time of day AMS is just a phone call away with full support services via our 24 hour Bulletin Board System

CIRCLE 297 ON READER SERVICE CARD

AMS
The Power To Go

AMS HOTLINE
800-267-6438



*AT&T Capital Based on 36-month lease with 10% purchase option. Sales tax and shipping are additional. Rates subject to change without notice. Leasing is provided by AT&T Capital for qualified commercial purchasers. Call for details. All trademarks and trade names are the property of their respective companies. Intel and Intel Inside are registered trademarks and Pentium is a trademark of Intel Corporation. Not responsible for errors in advertising.
**Money Back Guarantee: S/H and open software are non-refundable. Prices and specifications are subject to change without notice.
*Subject to availability from Microsoft.

Dis(K)organized?



DiskEasy™ is the new easy-to-use Diskette Management, Inventory and Labeling program designed for everyday computer use. DiskEasy is the only tool you need to organize, manage, label and catalog your diskettes - and the information they contain.

Whether creating new application or system backups, or downloading documents to disk, DiskEasy gives you the flexibility to create and customize your own diskette inventory system. Its advantages and features include:

■ **Automatic Diskette Inventory**

Simply insert the disk and click on the Read & Store button to automatically add it to your inventory.

■ **Full Search/Find Features**

Locate files and documents contained on a specific diskette in just seconds. No more searching through stacks of diskettes.

■ **Easy Labeling**

DiskEasy automatically creates diskette labels from your inventory in 3.5 and 5.25 label formats.

■ **No Manual to Read**

Context-sensitive On-Screen Help is easy to access by touching F1 on your keyboard

Order DiskEasy today!
Receive DiskEasy plus **FREE** 180 laser diskette labels for only \$34.95.*

Call 800-771-EASY or outside the US call 214 526 2446.

*Includes Shipping and Handling. Texas customers add 8.25% sales tax. We accept Phone Check, Mastercard and Visa



30-day money-back guarantee (less \$6.95 shipping/handling charges). Prices are for US only. Canadian residents add \$3.00, other countries add \$20.00. Prices subject to change without notice. IBM PC or compatible running Windows 3.1, VGA or better. Mouse compatible device, and minimum 4MB RAM required. ©1995, Verot Publishing Group, Incorporated. DiskEasy is a product of the Verot Publishing Group, Incorporated. All other products, names or logos are copyrights of their respective owners. Verot Publishing Group, Incorporated, 4514 Cole Avenue, Suite 600, Dallas, TX 75205 800-771-EASY

CIRCLE 313 ON READER SERVICE CARD

Discover the Power...

DTK QUIN Series.



QUIN-52

Dual Pentium™ 75/90/100Mhz Processor
8MB RAM, Up to 256MB
256K/512K Cache
PCI/EISA Architecture
3 PCI+3 EISA+1 PCI/EISA slots
PCI Local Bus Graphics-1 MB or 2 MB

QUIN-35

Pentium 75/90/100Mhz Processor
8MB RAM, Up to 128MB
256K/512K/1MB Cache
PCI/ISA Architecture
3 PCI+3 ISA+1 PCI/ISA slots
PCI Local Bus Graphics-1MB or 2MB
Built-in 2 Enhanced PCI IDE Interface
2 Serial (16550), 1 Game, 1 Parallel port



DTK's QUIN-35 ranked 10th in PC World's Top 20 (April 1995), outscoring its competitors by far! The QUIN -35 won Top 20 based on its outstanding performance and "astonishingly affordable" price.

Custom configured, the way you want! With mid-tower or desktop cases, any size hard drives, 14", 15", or 17" CRT low radiation Energy Star Compliant monitors, network cards, memory upgrades, floppy disks, 2X, 4X CD-ROM or the complete Multi-media kit with plenty of titles.

Software options include Microsoft Home Package (Encarta, Money, Works, & Entertainment Pack), Windows for Workgroups, Windows, DOS, and IBM-OS/2 Warp.

For more product information, please call our fax back service at 1-800-806-1DTK (Doc.# 801 for QUIN-35 & 802 for QUIN-52).



DTK Computer, Inc. Discover the Difference™!

Los Angeles
Tel: (818) 810-0098

Houston
Tel: (713) 568-6688

Chicago
Tel: (708) 593-3080

Miami
Tel: (305) 597-8888

New York
Tel: (908) 562-8800

Atlanta
Tel: (404) 246-0100



The DTK Logo is a registered trademark of DTK Computer Inc. Discover the Difference is a trademark of DTK Computer Inc. The Intel Inside and Pentium Processor Logos are trademarks of Intel Corporation. All other trademarks are properties of their respective owners. Specifications subject to change without notice. © DTK Computer Inc.

CIRCLE 201 ON READER SERVICE CARD

➤ **Add 3D sound to your PC!**

➤ **Supports Intel's Plug and Play for easy installation**

➤ **Cool DOS and Windows software included**

➤ **Professional-quality wavetable synthesis and MIDI support**

➤ **100% Windows, games and multimedia compatibility**

➤ **Great Price!**

NuSound PnP

Sound For Today's Computer

Old sound cards can't keep up with today's computer. With the right hardware, you not only hear your programs, you experience them. That is if you have the right sound card. A new sound card...

Orchid Technology's NuSound PnP is sound for today's computer. Plug and play compatible for easy installation. Wavetable synthesis for the hottest sound ever. 18-bit digital to analog converters on board. Spatializer 3D audio for a new sound experience. CD-ROM interfaces that work with today's super fast drives. Complete compatibility and support for all of the leading sound standards.

High-end audio you can afford

The NuSound is high-quality audio. Like your home CD player, we've included hi-fidelity features like 24-bit oversampling technology, low noise, and improved

bandwidth (20Hz to 20KHz). The net result is clean, pristine sound.

Plug and Play= Easy Installation

Old Sound cards are hard to configure and

install. NuSound PnP is the only sound card that is Plug and Play compatible. It's the only sound card that is 100% Windows 95 compatible. It's the only sound card that is 100% Windows 95 compatible. It's the only sound card that is 100% Windows 95 compatible.

Experience the new sound of NuSound PnP. See your dealer or call 1-800-705-0840 for more information!



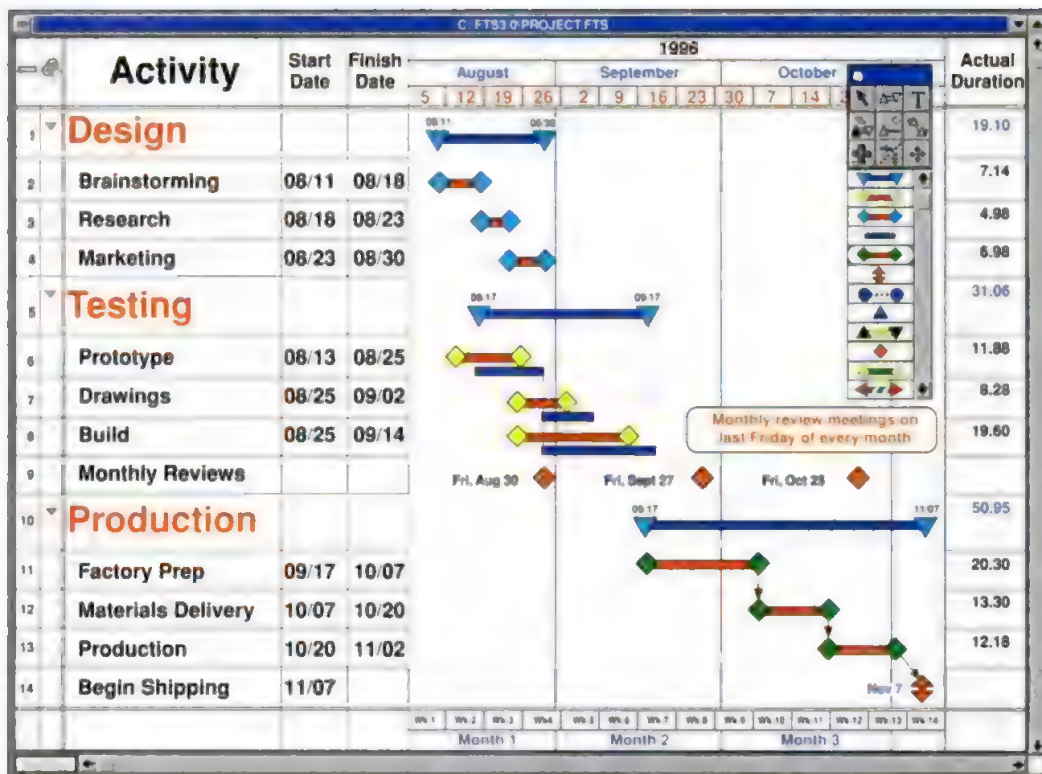
© Orchid Technology. NuSound is a trademark of Orchid Technology. All other trademarks are the property of their respective owners. Specifications subject to change. MSRP \$199. Contact your local dealer for more information. <http://orchid.net/images.com>. Orchid Technology, 2311 North Central Expressway, Suite 100, San Jose, CA 95131. Tel: 408/251-1111.



ORCHID TECHNOLOGY, INC.

Simple Scheduling. Impressive Power.

New
Version 3.0
Over 75
New Features!



*"FastTrack Schedule...
matches or exceeds
the competing products
in all aspects of
project scheduling."*

**Windows
Magazine**



*FastTrack Schedule*TM

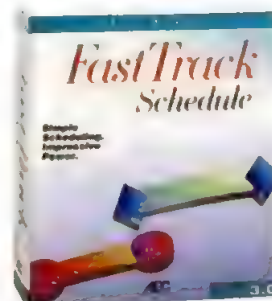
No other scheduling tool is as easy-to-use or as powerful as FastTrack Schedule. There's no need for cumbersome project management packages, spreadsheets, or time-consuming drawing programs. Simply click and drag—or use your keyboard—to create presentation quality schedules in no time. And if you have questions, the extensive on-line help can assist, tutor, or remind you of every step.

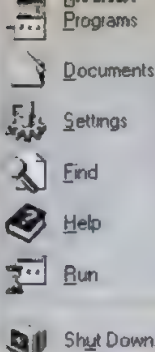
Need more power? FastTrack Schedule can track scheduled, revised, and actual dates, calculate durations based on a custom work calendar, outline your projects, and link activities to show dependent tasks. Further enhance your schedules with custom bars and milestones, flexible timeline scales, and colorful graphics. And because FastTrack Schedule runs on Windows, Macintosh—and is accelerated for Power Macintosh—files built on one platform can be opened on the other.

To order, for more information or for a demo—Call Today!

1.800.450.1986

AEC
SOFTWARE





PC Importers...

**You Upgrade source
for Windows 95**



MONITORS

RealVision	
14" SVGA 1024x768 28 NI.....	\$220
15" SVGA 1280x1024 28 NI.....	\$299
17" SVGA 1280x1024 28 NI.....	\$589



15" DX15F 1280x1024 28 NI.....	\$349
17" DX17F 1280x1024 26 NI.....	\$649
21" MX21F 1600x1280 25 NI.....	\$1699

VIDEO CARDS

Cirrus Logic 64bit PCI w/1Mb.....	\$89
Cirrus Logic 64bit PCI w/2Mb.....	\$139
Trident 64bit PCI w/1Mb.....	\$79
Trident 64bit PCI w/2Mb.....	\$129



Stealth SE, S3-Trio, PCI, 1Mb.....	\$99
Speedstar 64 PCI w/1Mb.....	\$145
Speedstar 64 PCI w/2Mb.....	\$195
Stealth 64 PCI DRAM w/1Mb.....	\$145
Stealth 64 PCI DRAM w/2Mb.....	\$195
Stealth 64 PCI VRAM w/2Mb.....	\$335
Stealth 64 PCI VRAM w/4Mb.....	\$485



Xpression Mach64 PCI 2Mb.....	\$219
ProTurbo Mach64 PCI 2Mb.....	\$349
ProTurbo Mach64 PCI 4Mb.....	\$569

HARD DRIVES



540MB, ST3860A, IDE, 11MS.....	\$175
730MB, ST3780A, IDE, 11MS.....	\$225
850MB, ST5850A, IDE, 11MS.....	\$229
1083MB, ST31220A, IDE, 11MS.....	\$309
11GB, ST31220N, SCSI-2, 9MS.....	\$499
21GB, ST32430N, SCSI-2, 9MS.....	\$879



540MB, AC2540A, IDE, 10MS.....	\$189
850MB, AC2850A, IDE, 10MS.....	\$225
1080MB, AC31000, IDE, 10MS.....	\$329
1280MB, AC31200, IDE, 10MS.....	\$339
1620MB, AC31600, IDE, 9MS.....	\$549



540MB, 7540AV, IDE, 10MS.....	\$175
850MB, 7850AV, IDE, 10MS.....	\$225
1050MB, 71050A, IDE, 10MS.....	\$309
1270MB, 71260A, IDE, 10MS.....	\$329

MOTHERBOARDS

486DX2/DX4 Green PC Motherboard

- 256K Cache ■ 3 PCI, 4 ISA slots ■ up to 64Mb
- Support 2FDD/4HDD ■ Enhanced IDE controller
- 2 Fast I/O ports ■ 4-72pin SIMM sockets

Without CPU.....	\$129
With AMD 486DX2-80MHz.....	\$259
With AMD 486DX4-100MHz.....	\$295
With Intel 486DX4-75MHz.....	\$299
With Intel 486DX4-100MHz.....	\$359

Pentium P-54 75/90/100 Motherboard

- 256K Cache up to 1Mb ■ Latest BIOS version
- 3 PCI, 4 ISA slots ■ up to 128Mb on board
- Support 2FDD/4HDD ■ Enhanced IDE controller
- 2 Fast I/O ports ■ 4-72pin SIMM sockets

Without CPU.....	\$199
With Intel P54-75MHz CPU.....	\$499
With Intel P54-90MHz CPU.....	\$599
With Intel P54-100MHz CPU.....	\$699

Pentium 75/90/100/120/133 Motherboard

- Intel TRITON Chipset (made by BIOSSTAR)
- 256K Cache up to 1Mb ■ Award Flash BIOS
- 3 PCI, 4 ISA slots ■ up to 128Mb on board
- Support 2FDD/4HDD ■ Enhanced IDE controller
- 2 16550 Fast I/O ports ■ 4-72pin SIMM sockets

Without CPU.....	\$249
With Intel P54-75MHz CPU.....	\$549
With Intel P54-90MHz CPU.....	\$649
With Intel P54-100MHz CPU.....	\$749
With Intel P54-120MHz CPU.....	\$1149

Pentium 75/90/100/120/133 Motherboard

- Intel TRITON Chipset (board made by Intel)
- 256K Cache ■ AMI Flash BIOS ■ 3 PCI, 4 ISA slots
- Supports EDO Memory ■ Up to 128Mb
- Support 2FDD/4HDD ■ Enhanced IDE controller
- 2 16550 Fast I/O ports ■ 4-72pin SIMM sockets

Without CPU.....	\$299
With Intel P54-75MHz CPU.....	\$599
With Intel P54-90MHz CPU.....	\$699
With Intel P54-100MHz CPU.....	\$799
With Intel P54-120MHz CPU.....	\$1199

MULTIMEDIA & CD-ROM

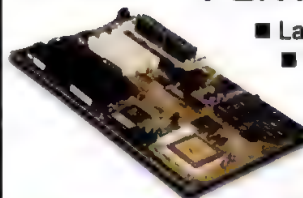


Sound Blaster 16 Value.....	\$99
S.Blaster 16 ASP w/SCSI-2.....	\$199
S.Blaster AWE-32 Value.....	\$169
SB Value CD Multimedia Kit.....	\$189
SB Discovery 4X Multimedia Kit.....	\$349
SB Home 4X Multimedia Kit.....	\$419

TOSIBA Quad Speed,SCSI-2.....	\$315
PLEXTOR 4PLEX,SCSI-2.....	\$319
Mitsumi,FX400,Quad,IDE.....	\$179
TEAC,Super Quad, AT intrf.....	\$189
Sony CDU-55E, 2X, IDE.....	\$115

MOTHERBOARD SPECIAL

PENTIUM P5-100MHz



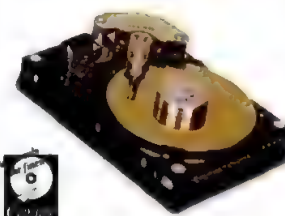
- Latest BIOS Version
- 256K Cache up to 1Mb
- 16Mb RAM up to 128Mb
- 3 PCI and 4 ISA Slots
- 2 High Speed Serial ports
- Support 2FDD/4HDD
- 64bit PCI Enhanced IDE contr.
- 64bit PCI Diamond Stealth 64 Video graphics card with 2Mb

\$1,499

HARD DRIVE SPECIAL



WESTERN DIGITAL



1280MB

WDAC31200
4500 RPM
10ms, Enhanced IDE
3 Year Warranty

\$339

853MB

WDAC2850A
4500 RPM
10ms, Enhanced IDE
3 Year Warranty

\$229

CD-ROM SPECIAL

Ultimate Multimedia performance

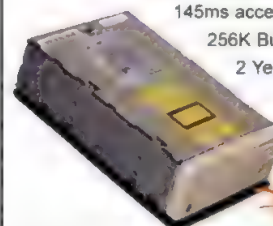
PLEXTOR 6PLEX

Six Speed, SCSI-2

145ms access 900Kb/s DTR

256K Buffer, 70,000 MTBF

2 Year Warranty • Internal



\$499

MITSUMI Quad

Quad Speed, IDE(ATAPI)

230ms access, 680Kb/s DTR

128K Buffer • Internal

2 Year Warranty

\$179

Let our product specialists find the "missing link" in your current configuration, and design the perfect upgrade to make you WIN95 ready!

1-800-75WIN95

All Prices and Specifications are Subject to Change Without Notice • PC Importers cannot be responsible for any omissions, errors in typography • All Returned Items Must Have an RMA# and Must be in Original Packaging • Shipping Charges are Not Refundable • Absolutely No Refunds for Items Returned after 30 Days • For More Information on Warranty and Policy Please Call • Microsoft Windows and Win95 are registered trademarks of Microsoft Corporation

CIRCLE 335 ON READER SERVICE CARD

PC Importers, inc

Sales:1(800)759-4695

Tech sup.:1(800)698-3820

Fax:1(216)487-5242

Business Hours:

Mon.-Fri.: 8am-8pm

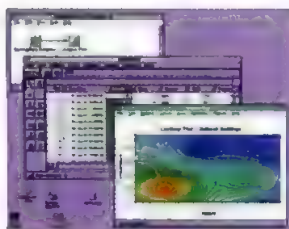
Sat.:10am-5pm EST

No Surcharge On These Credit Cards:





YOU CAN USE A SPREADSHEET TO ANALYZE DATA. OR YOU CAN USE CORNERSTONE.



Access, analyze, visualize
and present – all in Cornerstone's
integrated environment.

access, analyze, visualize and present data. All in an integrated environment that delivers the answers you need – faster and BBN/Cornerstone™ easier than any spreadsheet can. To

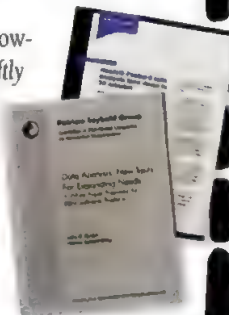
get things moving, send for your free Data Kit. It's got details on Cornerstone, user application stories and Data Analysis:

Introducing Cornerstone for Windows. The fastest path to the answers you need.

A spreadsheet wasn't designed for exploratory data analysis. So it's not the quickest and easiest way to turn data into information.

Cornerstone for Windows, however, gives you the power to swiftly

New Tools for Expanding Needs, a special report from the Seybold Group. For your Kit, call 1-800-331-2266 or fax the coupon today. And pick up the pace of your data analysis.



GET MOVING!

Rush me my free Data Kit! Fax this completed coupon to 1-508-429-8395. Email: Cornerstone@bbn.com

NAME _____
TITLE _____ COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
PHONE _____ FAX _____

Call BBN Software Products
800 331 2266 ext. 137

ARE YOU BEING **RIPPED OFF?**



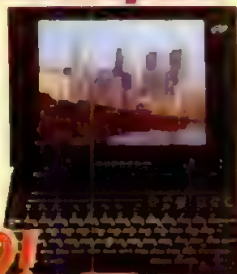
Take this simple quiz...then decide!

- | | | |
|--|------------------------------|-----------------------------|
| Does Your PC Vendor Give You <u>Toll-Free Technical Support?</u> | YES ☐ | NO ☐ |
| Can Your PC Vendor Ship Your Order . . . <u>Overnight Via Fed-Ex?</u> | ☐ | ☐ |
| Does Your PC Vendor Offer <u>24-Hour Toll-Free Ordering?</u> | ☐ | ☐ |
| Does Your PC Vendor Give You A <u>30-Day Money-Back Guarantee?</u> | ☐ | ☐ |
| Does Your PC Vendor Give You <u>Verified Low Prices?</u> | ☐ | ☐ |

PC Mall, the fastest growing PC catalog, gives you all of the above (and much, much more).
Skeptical? Call for our FREE Catalog and put us to the test...or order anything on these two pages and be prepared to be pleasantly surprised!

YOUR LOW PRICED **NOTEBOOK HEADQUARTERS!**

IBM® Thinkpad®
755CX
Pentium™
75MHz/
#72773
AS LOW AS
\$5699!



ZENITH Z-NoteFlex
486DX2/50MHz
• 4MB RAM, 200MB HD,
• 14.4 Fax/Data Modem
• Active Matrix Color Display #72674
\$1999!



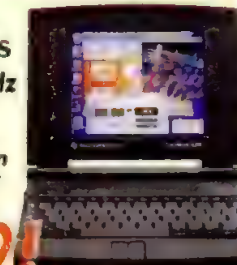
Toshiba 2150CDS
CD-ROM
Color Notebook
#72430
AS LOW AS
\$2999!



NEC Versa™ P
Pentium™ 75MHz
8MB RAM
340MB HD
Active Matrix Display
PLUS
FREE DOCK II
or \$300 Cash
Rebate* #72412
\$4069!



TravelMate 4000M
TEXAS INSTRUMENTS
486DX4/75MHz
4MB RAM
455MB HD
9.5" Dual Scan
Color Display
#72098
\$2219!



EzBook
486DX2/66MHz
10.4" Dual-scan
Color Display
• 4MB RAM
• 340MB HD
• Carrying Case
#72415
\$1989!



HARDWARE BARGAINS OF THE MONTH

**Quad-Speed
Internal
CD-ROM
Kit**
By ValueMedia
\$189⁹⁹!
#72678



Turn your PC into a fax, copy
and filing machine!
PaperPort™
Feed in any document
and it turns into a
digital page on
your screen in
seconds!
\$359⁹⁹
#71021



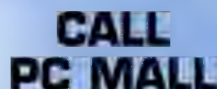
**Hi-Val Internal
Sony Double-Speed
CD-ROM
Drive**
\$99⁹⁹!
#72034



**28.8 V.34
Internal
Fax/Data Modem**
\$129⁹⁹!
By Newcom
**14.4 Internal
Fax/Data Modem**
ONLY!
\$49⁹⁹!
By Best Data #72072



**MICROSOFT
WINDOWS**



1-800-555-2555

Microsoft®	Windows™	for	Windows™	95
Microsoft®	Plus 1.0	for	Windows™	95
Microsoft®	Office	for	Windows™	95
Microsoft®	Excel	for	Windows™	95
Microsoft®	Word	for	Windows™	95
Microsoft®	PowerPoint	for	Windows™	95
Microsoft®	Project	for	Windows™	95
Microsoft®	Schedule	for	Windows™	95
Microsoft®	Works	for	Windows™	95

CIRCLE 301 ON READER SERVICE CARD

Ability, an Office Suite easier, less expensive and \$9.95 for 30 days.

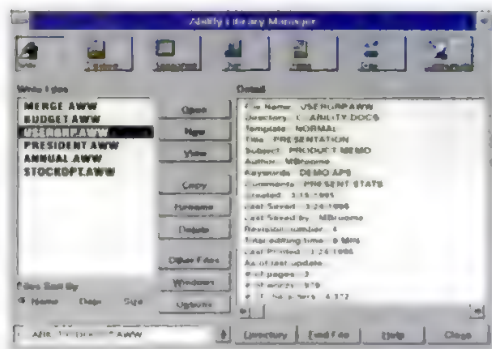


It's only \$9.95 for a 30-day trial of Ability Windows, the *alternative* application suite. But you won't need all 30 days to discover what you gain with Ability: Namely time. And productivity. And a way of working that is easier to learn and use than anything else on the market.

Ability believes your time is better spent *doing* rather than *learning*. So Ability makes sure you can start *doing* right away. No training needed.. No time-consuming manuals. Just install and get busy.

Ability is the only software designed for the way people actually think and work. [Special bulletin for laptop users: Finally, with Ability, you can install, load and run all 7 applications: **Write, Spreadsheet, Chart, Database, Forms, Draw & Communicate.**]

The secret is Ability's Library Manager, a seamless access to all the functions you need to perform within this fully integrated 20MB package. (Other software uses 3 to 5 times as much disk space.)



Ability Library Manager

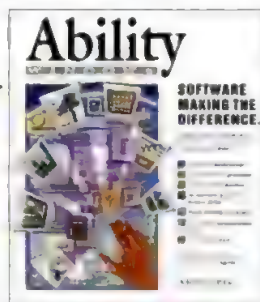
FREE NO-RISK 30-DAY TRIAL

For a limited time we are offering a 30-day trial of Ability. You pay only \$9.95 for shipping and handling. The full program is yours to use and enjoy FREE for 30 days from the date it is loaded into your computer.

At the end of 30 days, the software will close down. Yes, it will give you ample warning, and all of your work will be saved.

To purchase your copy of Ability Windows, call the toll free number below.

Until August 31st you can get Ability at the special introductory price of only \$179 (regularly \$299).



TO ORDER CALL

1-800-522-3340

"If you are looking for a Wordprocessor-Database-Spreadsheet combination, for the price, Ability Windows is hard to beat."

Let's Talk Computers Alan Ashendorf

Ability™

Software making the difference.

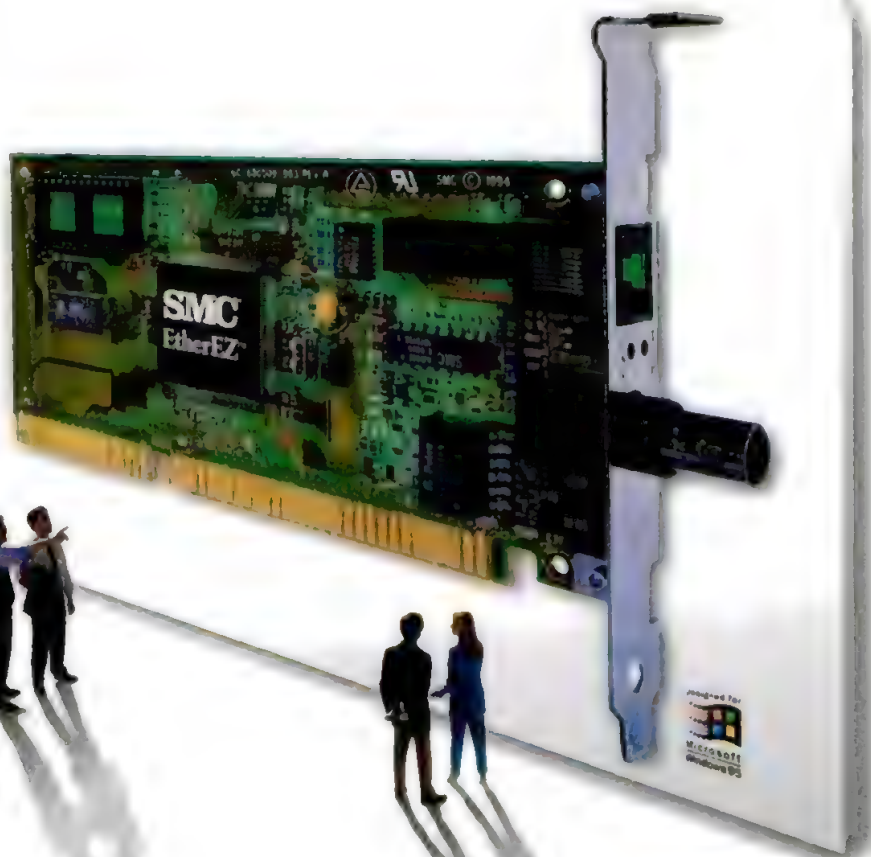
System Requirements: Minimum 386 w/ 4Mb RAM
Windows 3.11, 20 MB of hard disk space
Optimal 486 SX w/ 8Mb RAM
Microsoft is a registered trademark of Microsoft Corporation



©APS (America) Ltd., 1995

CIRCLE 300 ON READER SERVICE CARD

Ability Plus Software
6816 Morrison Blvd., Charlotte, NC 28211
FAX (704) 364-5676 • CompuServe GO ABILITY
EMAIL: info@ability.com • URL: <http://www.ability.com/>



Any way you look at it, it's the best Ethernet card for you.

With 24 years' experience and 10 million network cards sold, SMC knows what you need in an Ethernet card. Fast and easy installation. Exceptional performance. Great price. And 100% satisfaction, guaranteed.

You'll find that and more in SMC's EtherEZ.

For starters, no Ethernet card is easier to install. You can network a PC with EtherEZ in less than a minute.

EtherEZ is also the fastest ISA Ethernet card we've ever made—and its performance rivals that of any other card on the market.

You can be sure EtherEZ will work with your network, because EtherEZ comes with the best driver selection in the industry, with support for

hundreds of operating systems. EtherEZ drivers ship with Novell NetWare, Windows NT, and even Windows 95.

Best of all, we've reduced our price, so EtherEZ's price/performance challenges any competitor's.

Take the EtherEZ Challenge

We're so sure EtherEZ is the best Ethernet card for you, we've backed it with an unprecedented guarantee. Try it. You'll be 100% satisfied, or we'll replace it with the card of your choice*, free.

For more information on EtherEZ, call 1-800-SMC-4-YOU, and ask for Dept. EC31.

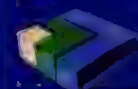
EtherEZ. It's the best card we've ever made. And that makes it the best card for you.

SMC®

1-800-SMC-4-YOU

*If, as an end-user, you are not satisfied with SMC EtherEZ, SMC will replace it with your choice of an SMC 16-bit ISA Elite or Ultra network card. Guarantee valid on end-user EtherEZ purchases made between June 1 and August 31, 1995, subject to terms and conditions. All replacement claims must be received by September 30, 1995. For complete information, call 1-800-SMC-8329, and ask for document 5601.

Microsoft, Windows, and the Windows logo are registered trademarks of Microsoft Corporation. All other trademarks and registered trademarks are the properties of their respective holders. ©Copyright 1995 Standard Microsystems Corporation.



SMC UNITY

Solutions for:

LAN Access

Ethernet Adapters

Fast Ethernet Adapters

Token Ring Adapters

Portable Connectivity

Ethernet Hubs

Token Ring MAUs

Bandwidth
Acceleration

Ethernet Switching

Token Ring Switching

Stackable Hubs

Intranetworking

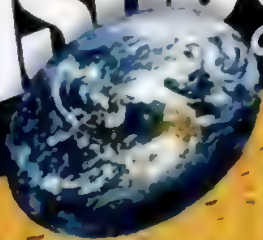
Backbone Solutions

Fast Ethernet Solutions

Multiprotocol Switching

ATM, HSSI, FDDI

THE DISCOVERY CHANNEL



EXPLORE

Michael Jackson BEER HUNTER

THE COMPLETE INTERACTIVE
GUIDE TO THE BEER RENAISSANCE

NEVER LOSE ANOTHER
argument ABOUT BEER
EVER!

Now there's a CD-ROM that matches your taste in fine brew. Whether you want to sample micro-brews, imported brews—or even learn how to brew your own! Join Michael Jackson, world-renowned beer expert, on a pub crawl and sample the finest products of the brew master's art. Use *The Beer Hunter* to study the brewing process and compare home brewing recipes. Amuse yourself with the history of beer and its terminology to settle those barroom disputes. Browse through 200 different brands and study their labels. Get the latest information on the micro-brewery revolution. Map out a world-wide tour of beer fests. Print out your private pocket testing guide. Then compare Michael Jackson's top 24 recommendations with your own list of the world's finest brew.

For more information on this product or to get your copy of our free CD-ROM brochure, call

1-800-762-2189

For the experts or for the novice, *The Beer Hunter* is the essential guide to the appreciation of great beers.

Available in Windows and Mac versions. © 1995 DCI

CIRCLE 327 ON READER SERVICE CARD



**NOW WITH
UPGRADE ASSISTANT
FOR WINDOWS 95**

REMOVE-IT NEVER FORGETS TO TAKE OUT THE TRASH.

Oops. You let your guard down and now your hard disk is a mess. And the old applications, fonts, and files littering your PC's landscape are more than just unsightly. They can fill up your hard disk and sabotage system performance. Wouldn't it be great if someone could clean the garbage out of your computer, or even your entire network? A trusted friend who could do the job automatically, safely, and thoroughly?

Look no further: Remove-IT is the ultimate custodian for your computer.

IT'S A BROOM WITH A BRAIN

Don't feel guilty about having a messy hard drive—it's really not your fault. You see, every time you install a program, it hides bits and pieces all over your system. And here's the kicker: Even when you delete the application, piles of "secret" garbage are left behind.

But there's no trash heap that Remove-IT can't find. Its watchful Smart Disk Custodian automatically alerts you to unused or unneeded

programs. And Remove-IT has a unique Installation Knowledge-Base—a virtual encyclopedia of more than 850 popular

the wrong files. Remove-IT is more powerful and far more user-friendly than any competing program. It just works smarter—way smarter!

LEAVES EVERY OTHER UNINSTALLER IN THE DUST

	Remove-IT 2	Uninstaller 3
Smart Disk Custodian	✓	No
Cleanup Coach	✓	No
Installation Knowledge-Base	✓	No
Windows 95 Upgrade Assistant	✓	No
Emergency Recovery Disk	✓	No
Automatic Installation Logging	✓	Limited

Windows- and DOS applications. Together with the Log-IT feature, it remembers the location of everything you install to ensure safe and complete removal. Remove-IT even makes self-installing backups so you can easily transfer your programs to other PCs.



SAFE SANITATION

You never have to worry about damaging critical files and applications when you "clean house." Remove-IT's helpful Cleanup Coach expertly guides you through the removal process, while its Safe Removal Technology protects you from deleting

ARE YOU REALLY READY FOR WINDOWS 95?



Remove-IT has a customized Upgrade Assistant that automatically prepares your PC for Windows 95 and reduces the chance of an upgrade problem. Then it cleans and configures your system after

Windows 95 is installed. And even though Remove-IT is the most powerful cleaning machine you can buy, it won't clean out your pocketbook.

We're now offering the latest version of Remove-IT—version 2.0—for just **\$44.95**. Ask for Remove-IT at your favorite retailer, or call our handy toll-free number:

1-800-380-2607

Ask for ext. 508



Vertisoft
superior software solutions

ESSENTIAL SOFTWARE

COMPU-USA

City

SP

EDV

FIT

PC Connection

©1995 Vertisoft Systems, Inc., Four Embarcadero Center, Suite 3470, San Francisco, CA 94111 Outside the U.S. call 800-295-5875. Remove-IT is a registered trademark of Vertisoft Systems, Inc. All other trademarks or registered trademarks are the property of their respective holders. Offer includes a 30-day money-back guarantee. Prices listed in U.S. dollars. Price includes shipping. Sales tax not included. Allow 3 weeks for delivery.

CIRCLE 312 ON READER SERVICE CARD

CONTROL YOUR PROJECTS BEFORE THEY CONTROL YOU

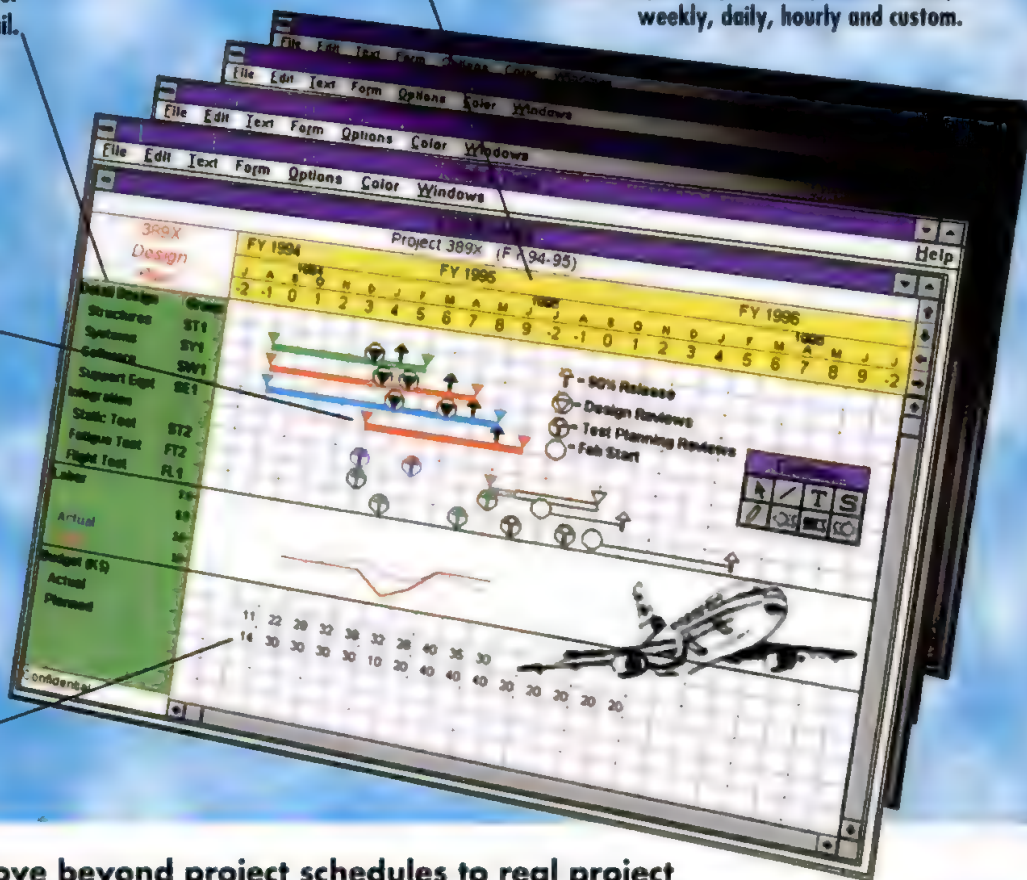
The Power of Plan&Track™ is in its Simplicity

List the project tasks and associated data. Link a project task to a lower level schedule for increased detail.

Just drag out task bars and click to indicate progress. No need to work through tedious dialog boxes entering numbers.

An integrated spreadsheet automatically does calendarized cost projections. Use earned value functions to automatically calculate a project's schedule and cost variances to show overall project status.

A flexible calendar handles both fiscal and calendar years. Automatically create and manage a calendar with scales such as quarterly, monthly, half-monthly, weekly, daily, hourly and custom.



\$179

**\$285.00 Suggested
Retail Price**



Mainstay

591• A Constitution Avenue
Camarillo, CA 93012-9812
phone: (805) 484-9400
fax: (805) 484-9428

Move beyond project schedules to real project management—without needing to be an expert in project management software. Plan&Track™ is a simple Gantt chart approach with integrated spreadsheet and graphing. It lets you easily plan and track a project's progress, financials, and resources. Create presentation quality charts just minutes after opening the box. Present the plan to your boss or customer with confidence and track progress to keep everyone informed. With Plan&Track, stay in control and bring the project to a successful completion.

ORDER YOUR COPY TODAY
800-484-9817 (code 4187)



Also Available for Macintosh

CIRCLE 319 ON READER SERVICE CARD

Big Sellers.

Bigger Sellers.



CTX monitors—some of the best selling color monitors in the US.*



CTX's new 20-inch, (19"V) monitor — giving you even more for less.

Look what's happened to CTX and our color monitors. We've both grown bigger.

CTX is now a leading supplier of professional multi-frequency color monitors to the U.S., out-selling the big names like NEC, Mitsubishi, IBM, Sony and Apple.* We did it by providing more for less.

PC World Magazine (April '95) just named our 1785GM monitor as their "Best Buy".

In May, 1995, MacUser Magazine rated the 1785GM image



quality "Outstanding".

And PC Magazine reported that "CTX (17-inch) monitors have features you might not expect at these prices."

CTX monitors were also recently honored by the EPA for "highest percentage of product line (100%) converted to Energy Star specifications."

Now we're introducing a new 20-inch, (19"V) color monitor. The 2085 has a fine .28mm dot pitch that's ideal for high-resolution, big-screen graphics applications. It



comes complete with more front-panel controls than you could ever need. Plus a three-year warranty; PC, Mac and workstation compatibility; MPR-II compliance; and CTX SuperStar™ power-management savings that exceed EPA Energy Star specs by more than 80 percent.

It's time to get bigger and better for less!



Choice of the Pros.

USA Headquarters 909-595-6146, Eastern Region 201-646-0707, Midwestern Region 708-285-0202, Southern Region 404-729-8909. **FasFax 818-837-4341, 026, Document 455.**

©1995 CTX International, Inc. All brand names are trademarks of their respective owners. *Official Stanford Resources Inc. "Monitrak" research. 1785GM pictured above Viewable diagonal for CTX 14, 15, 17, & 20-inch monitors are 13, 14, 16 and 19 inches, respectively. *On all monitors: 2 year warranty on CRT PCM/8/95

CIRCLE 266 ON READER SERVICE CARD

Home Suite Makes Life Sweet



Both 3.5" disk and CD-ROM included.

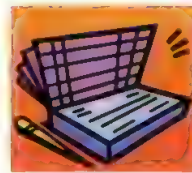
Runs under Windows and Windows 95



Party/Wedding Planner
Make your next party your best party. Organize guest lists and invitations. Track expenses, gifts and thank-you notes.



Phone Book
Put your phone book on line and never lose track of a friend's phone number again. Store phone and fax numbers, and use your modem to dial automatically.



Home Budget
Take control of your income and expenses. Analyze your spending habits. Print checks and keep an on-line register. Develop a budget and then track your progress.



Home Inventory
Record all your valuables for insurance purposes. View belongings by category or location. Estimate replacement costs.



Contact Manager
Track business and social contacts and record each call, letter, fax or meeting you have with each person.



Home Repair
Every home owner knows a house requires constant upkeep. Track repairs, improvements and expenses. Plan for major projects.



Mail List Manager
Organize mailing lists for business or home use. Track business and social acquaintances and print labels for large mailings.



Home Library
Inventory your CDs, books, magazines and baseball cards. Keep track of your collection and print reports.

Plus!

Stock Portfolio
to keep track of your investments.



Club Membership
Manage your club's membership list, keep track of donations and organize members into committees.

Conversion Calculator
the ultimate universal conversion utility with dozens of conversion types.

\$39⁹⁵

All The Home Management Programs You'll Ever Need...Under One Roof.

We know you're busy. Don't waste your precious free time organizing your household. Let *The Complete Home Suite™* take the work out of home work. We've done all the set-up for you. Order today!

Available At

COMPUSA
THE COMPUTER SUPERSTORE
1 800-COMPUSA

CIRCLE 296 ON READER SERVICE CARD



The Complete Home Suite™

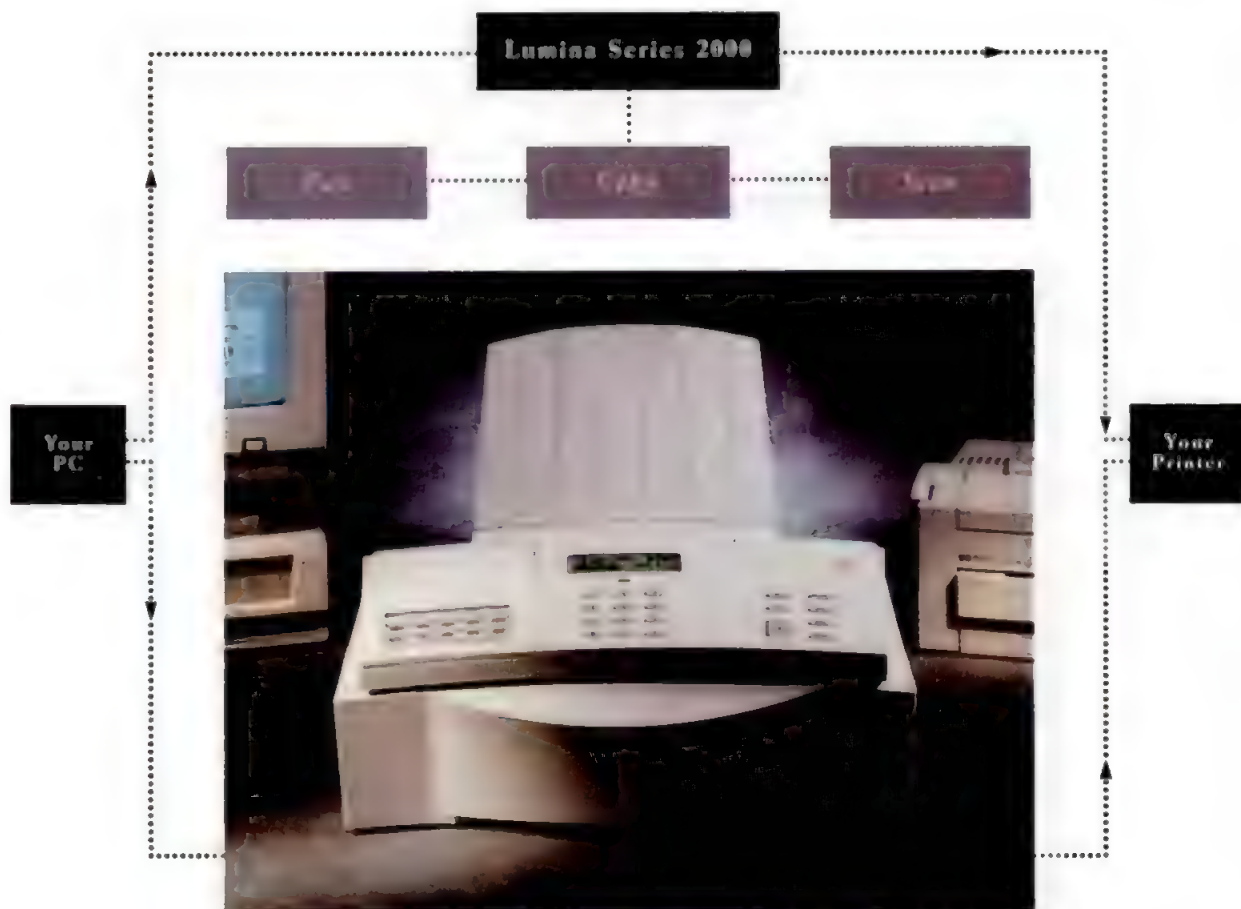
1-800-441-ALPHA

6 1 7 - 2 2 9 - 2 9 2 4

Alpha Software Corporation

ACU

*Prices may vary at retailers. © Copyright 1995, Alpha Software Corporation, 188 Middlesex Turnpike, Burlington, MA 01803, 617-229-2924, Fax 617-272-4876. All rights reserved. All other brands are the property of their respective owners.



USING YOUR PC AND PRINTER, THE LUMINA SERIES 2000 OFFERS COMPLETE MULTI-FUNCTIONALITY WITHOUT THE PRICE. (MSRP UNDER \$600)

A little ingenuity goes a long way. And in the case of the Lumina Series 2000, it goes even further.

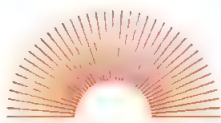
The Lumina Series 2000 is a multi-function product that connects between your PC and printer to deliver all the capabilities of a fax machine, copier, and scanner in one easy-to-use, compact unit.

Hook it up to your inkjet or laser printer and you have an instant stand-alone, plain-paper fax machine and plain-paper copier. Connect it to your PC running Windows™, and you'll have everything you need to scan documents for easy storage and retrieval.

The Lumina Series 2000 is also loaded with other powerful features you won't want to be without, like fax management software that enables you to send and receive faxes from your PC.

Perhaps the most ingenious feature of the Lumina Series 2000 is its price: MSRP under \$600.

That alone puts it in front of other multi-function products. Combine it with the Lumina Series 2000's other features, and you're the one who comes out ahead. For more information on the Lumina Series 2000 call 800-586-4620.



Specialists in Multi-function Office Products

Lumina Office Products 265 Santa Ana Court Sunnyvale, CA 94086 Phone: (408) 992-1088 Fax: (408) 992-1090 Toll Free: (800) 586-4620

© 1995 Lumina Office Products. Windows is a trademark of Microsoft Corporation.

CIRCLE 328 ON READER SERVICE CARD

Play's Pocket-Sized Breakthrough Brings Stunning Pictures From Video Into PCs



Play's new Snappy lets you grab stills from any camcorder, VCR or TV right into your PC. It's easy! Just plug Snappy into the printer port on the back of your desktop or laptop PC. Then connect any video source to Snappy with the included cable. Watch the on-screen moving preview and when you see the picture you want, click *Snap*.

Play's Snappy is guaranteed to grab the highest quality video stills you've ever seen on *any* computer at *any* price. Play's engineers developed a sophisticated new chip called the HD-1500 that captures sensational images

in 16.8 million vibrant colors at breathtaking resolutions up to 1500 x 1125. It's perfect for thousands of uses from desktop publishing, presentations, databases, and Internet images, all the way to PC photo albums, school reports, real estate imaging or just morphing your boss into your cat.



Includes Award Winning Software

Each Snappy includes Fauve® Matisse SE, the outstanding paint, retouching and titling program. You also get Gryphon Morph™ 2.5, the same morphing, warping and special effects software used on the cover of *Time Magazine*.

FREE Demo Disk

Call 800.306.PLAY
or get the demo right now from
<http://www.play.com>



2890 Kilgore Road
Rancho Cordova, CA 95670-6133
916.851.0800 • FAX 916.851.0801

Demo also available for direct download (at up to 28.8 kbps) from Play's BBS at 916.983.3288. Snappy is a trademark of Play Incorporated. All other trademarks are the property of their respective holders. © 1995 Play Incorporated.

CIRCLE 324 ON READER SERVICE CARD



**NEW LOW
PRICE**
\$1795 EXTERNAL UNIT
\$1595 INTERNAL UNIT

Image scanned on Coolscan

ONE OF OUR BIG POSITIVES
IS A NEGATIVE.

If you use 35mm negative film as your primary medium, you'll be glad to know Coolscan™ handles both positives *and* negatives beautifully — whether you're using a Mac or a PC.

Just insert a 35mm slide or negative filmstrip. Select a true resolution up to 2700 dpi. And the scanner (which, by the way, fits into most half-height disk drive bays) does the rest.

You'll be positively thrilled about the price of Coolscan, too. Just \$1595.* A compact, light-weight, external model is also available for just \$1795.*

Coolscan. Positively the best value in desktop film scanners. For the location of your nearest Nikon Coolscan dealer, or for a free brochure, call 1-800-52-NIKON or (516) 547-4355.



Recent awards from consumer and trade publications



Nikon
ELECTRONIC IMAGING

*Prices shown are manufacturer's suggested retail and are subject to change without notice.

©1994 Nikon Inc.

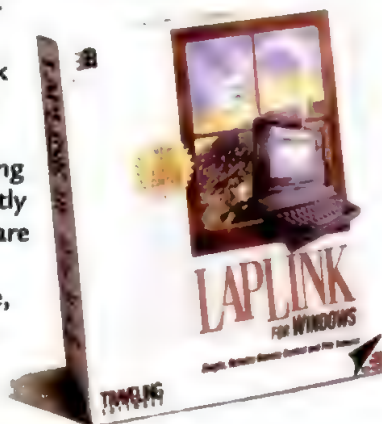
CIRCLE 318 ON READER SERVICE CARD



LapLink® Gets You There And Back

The road to Windows 95 promises to be exciting. But if you ever communicate with another PC you could run into a roadblock. *There's nothing in Windows 95 that lets you communicate with Windows 3.1 users.* Fortunately, LapLink for Windows clears the way with your lifesaving link between Windows 3.1 and Windows 95 machines. Here's why LapLink is an essential tool for getting to Windows 95.

Remote Control Remote control gives you uncomplicated access to applications and data from home or portable PCs. You'll effortlessly connect to the office even if your PCs are running different versions of Windows. LapLink for Windows supports your Help Desk staff by letting them look at exactly what other users are experiencing on-screen in real time, correct problems,



and even train users without being on site. This is the *only* tool that lets techs work with up to 15 systems in 15 different locations simultaneously over network, modem and cable.

File Transfer with SpeedSync™ When you purchase LapLink for Windows, you get the simple, reliable file transfer functions Traveling Software products are famous for. LapLink efficiently moves everything or anything to your new Windows 95 PC. Then, when you update files, SpeedSync transfers *only the changes* for time savings of up to 80%! As always, high-quality serial and parallel cables are included for immediate connectivity.

When it comes to Windows connectivity, LapLink is your Win/Win solution. It supports any combination of Win 3.1 and Win95 systems. Cruise to your nearest computer or office superstore today. Or call 1-800-487-4305 for your free "Tips and Tricks for Managing Your Transition to Windows 95".

**TRAVELING
SOFTWARE**

18702 North Creek Parkway, Bothell, Washington 98011 USA
Internet home page at <http://www.travsoft.com/>

Traveling Software, LapLink, and SpeedSync are registered trademarks of Traveling Software Inc. Windows and Windows 95 are registered trademarks of Microsoft. Other company or product names mentioned herein are trademarks or registered trademarks of their respective companies.

CIRCLE 337 ON READER SERVICE CARD



Image scanned on Scantouch

FINALLY, SCANS YOU DON'T HAVE TO APOLOGIZE FOR.

INTRODUCING NIKON SCANTOUCH™. It does what other flatbed scanners are supposed to do. By combining pinpoint resolution, blazing speed, ease of operation and an unparalleled reputation for quality and reliability, Nikon has created the perfect solution for almost every Mac or PC scanning situation. At an exceptionally low cost, only \$1535.

For OCR applications, the extra high resolution of the Scantouch will virtually eliminate embarrassing and costly OCR misreads. No more mistaking *fool* for *foot* or *ton* for *ten*.

For graphics applications, what you scan is what you get. Nikon Scantouch gives you clean, crisp images and lifelike colors that convey every detail and nuance of your original.

Scantouch even provides superior results with transparencies and negative film.

If you're tired of making excuses for your scanner, it's time for a scanner that will make an impact for you. Nikon Scantouch. For the location of your nearest Nikon Scantouch dealer, or for a free brochure, call 1-800-52-NIKON or (516) 547-4355.

Why Put Off Tomorrow What You Can Learn Today!

**RUNS ON
WINDOWS 3.1x
& WINDOWS 95**

INTERACTIVE PREVIEW TOUR



\$39.95

Start your transition to Windows 95 with the ClassAct95 Windows 95 Interactive Preview Tour.

Learn Windows 95 and many other Windows software programs using ClassAct's exclusive software simulation training program. •

Not just another video on CD-ROM. • Up to 30+ Hours and 300+ lessons of Training on each CD-ROM •

Self-Paced Learning • Individual Exploration • Increased Retention •

Access Any Information at Any Time • See your local reseller or call us.

Training Available for Microsoft Windows 95, Windows 3.1x, Office 4.2, Word 6.0, Excel 5.0, PowerPoint 4.0, Access 2.0;
Novell PerfectOffice, WordPerfect 6.0a & 6.1, Quattro Pro 6.0, Presentations 3.0; Lotus AmiPro, 1-2-3, and more.



FAXBACK 1-800-SO FAX CD

SOFT-ONE CORPORATION / CLASSACT
1121 SOUTH OREH BOULEVARD • OREH • UTAH • 84058
1-801-221-9400 • FAX 801-221-9942



CIRCLE 306 ON READER SERVICE CARD

**SOFT
ONE**

1-800-COLEARN

Tests show, when it comes to remote access performance, we have an unfair advantage.



You can have it, too. In a straight up comparison of three leading remote access products, The Tolly Group found RLN® version 4.0 to be across-the-board the fastest performer for four of the most common applications. Tested were Attachmate® RLN, Shiva LanRover™ and Microsoft® RAS.



In all fairness, the odds were stacked against our competition. RLN is the only remote product that seamlessly integrates remote node and multi-user application server technologies into one solution. Everything from e-mail to host access, databases to LAN access, runs at optimal speed. That's top access to any app, on any network or host, from

anywhere using ISDN, X.25 or async.

RLN is not just fast, but easy, too. Remote users can be oblivious to whether they're using RLN or the RLN Application Server, because the system is configured to choose the fastest possible access path.

So if you need a solution that lets your remote users get to their applications faster than any other, give us a call. We'll fill you in on RLN's speed, plus its superior security, management and scalability features and our upcoming Windows® 95 release.



Attachmate.



FOR A FREE DEMO DISK, TOLLY RESULTS, UNDERSTANDING REMOTE COMPUTING WHITE PAPER, OR SEMINAR INFO, CALL 800-426-6283, CODE 36.24.

Or call 206-644-4010. Internet: <http://www.attachmate.com>. ©1995 Attachmate Corporation. All rights reserved. Attachmate and RLN are registered trademarks of Attachmate Corporation. Microsoft and Windows are registered trademarks of Microsoft Corporation. LanRover is a trademark of Shiva Corporation. All other brand and product names are trademarks or registered trademarks of their respective owners.

CIRCLE 389 ON READER SERVICE CARD

HARD DRIVE SUPER SOURCE

WELCOMES ALL GOVERNMENT & CORPORATE PURCHASE ORDERS

4.3GB FAST SCSI-2 Seagate

MODEL# ST15230N

- 4.3GB Capacity Fast SCSI-2!
- Highest Performance 3.5" Discs!
- Fast Average Seek Time of 9.5ms!
- 512KB Cache Buffer, 5411RPM!
- 800,000 Hours MTBF!
- Five Year Limited Warranty!

External Unit\$1299

\$1149

HARD DRIVES

Quantum

MAVERICK IDE & SCSI-2 SERIES
270MB IDE 30270MVA 14ms \$169
540MB IDE 30540MVA 14ms \$179
540MB SCSI 30540MVS 14ms \$189

LIGHTNING IDE & SCSI-2 SERIES
540MB IDE 30540LTA 11ms \$199
730MB IDE 30730LTA 11ms \$239
385MB SCSI 30385LTS 11ms \$219
540MB SCSI 30540LTS 11ms \$219
730MB SCSI 30730LTS 11ms \$269

TRAIL BLAZER SERIES
420MB 30420TRA 12ms ATA-2 \$169..\$N/A
850MB 30850TRA 12ms ATA-2 \$249..\$N/A
420MB 30420TRS 12ms FSCSI-2 \$179..\$279
850MB 30850TRS 12ms FSCSI-2 \$269..\$369

FIREBALL SERIES
540MB 30540FBA 12ms ATA-2 \$189..\$N/A
1.08GB 31080FBA 12ms ATA-2 \$319..\$N/A
540MB 30540FBS 12ms FSCSI-2 \$199..\$299
1.08GB 31080FBS 12ms FSCSI-2 \$429..\$529

ThunderBolt SERIES
420MB 30420LPA 12ms ATA-2 \$179..\$N/A

EMPIRE FAST SCSI-2 SERIES
1.08GB EMP1080S 9.5ms 3.5" \$389..\$689
2.1GB EMP2100S 8.9ms 3.5" \$889..\$1889

CAPELLA FAST SCSI-2 SERIES
1.1GB VP31100S 8.5ms 3.5" \$999..\$1999
2.2GB VP32210S 8.5ms 3.5" \$1999..\$3999

ATLAS FAST SCSI-2 SERIES
2.1GB XP32150S 8ms 7200RPM \$899..\$1899
4.3GB XP34300S 8ms 7200RPM \$1499..\$1999

GRAND PRIX SCSI-2 SERIES
4.3GB GP34301S 8.5ms 7200RPM \$1099..\$1999

Maxtor

IDE & ENHANCED IDE DRIVES
420MB 7420AV 12ms IDE \$175
540MB 7540AV 12ms IDE \$195
850MB 7850AV 12ms E-IDE \$239
1.2GB 71250AV <12ms E-IDE \$379

CONNER

IDE & ENHANCED IDE DRIVES
420MB CFS420A 14ms IDE \$175
540MB CFS540A <15ms IDE \$199
540MB CFA540A 12ms E-IDE \$219
850MB CFS850A <15ms E-IDE \$259
850MB CFA850A <12ms E-IDE \$269
1.27GB CFI275A <15ms E-IDE \$359
1.27GB CFI275A 12ms E-IDE \$389

FAST SCSI-2 SERIES
1.0GB CFP1060S 9ms 3.5" \$459..\$659
1.0GB CFP1060S "NEW" 3.5" \$439..\$639
2.1GB CFP2105S <9ms 5400RPM \$839..\$1039
2.1GB CFP2107S <9ms 7200RPM \$959..\$1159
4.2GB CFP4207S <9ms 7200RPM \$1329..\$1429

WESTERN DIGITAL

EXTERNAL IDE DRIVES
540MB WDAC2540 12ms 3.5" \$225
730MB WDAC2750 10ms 3.5" \$249
730MB WDAC2850 <10ms 3.5" \$269
1.0GB WDAC31000 <10ms 3.5" \$349
1.2GB WDAC31200 <10ms 3.5" \$369
1.6GB WDAC31600 <10ms "NEW" \$639

HARD DRIVES

MICROPOLIS

IDE DRIVE
1.75GB MC2217A 10ms 3.5" \$689

FAST SCSI-2 DRIVES
1.75GB MC2217 10ms 3.5" \$839..\$939
2.0GB MC3221 8.5ms 3.5" \$979..\$1079
2.0GB MC4221 8.5ms 3.5" \$999..\$1099
3.0GB MC1838 13ms 5.25" \$859..\$1059
4.0GB MC3243 8.5ms 3.5" \$1349..\$1449
9.1GB MC1991 11ms 5.25" \$2399..\$2599

Audio Video FAST SCSI-2 DRIVES
1.75GB MC2217AV 10ms 3.5" \$849..\$949
2.0GB MC3221AV 8.5ms 3.5" \$1089..\$1189
2.0GB MC4221AV 8.5ms 3.5" \$1099..\$1199
3.0GB MC1938AV 13ms 5.25" \$1329..\$1529
4.0GB MC3243AV 8.5ms 3.5" \$1499..\$1599
9.1GB MC1991AV 11ms 5.25" \$2499..\$2649

Seagate

IDE & ENHANCED IDE DRIVES

170MB ST3195A 11ms 3.5" \$149
420MB ST3401A 14ms Fast ATA \$189
720MB ST3780A 12ms Fast ATA2 \$245
850MB ST35850A 11ms Fast ATA2 \$259
1.0GB ST31220A 12ms Fast ATA2 \$339

FAST SCSI-2 SERIES

1.0GB ST31230N 10ms 3.5" \$529..\$629
1.0GB ST31200N 9ms 3.5" \$535..\$635
2.1GB ST32430N 10ms 3.5" \$899..\$999
2.1GB ST32550N 8ms 3.5" \$1069..\$1169
4.3GB ST31510N 8ms 3.5" \$1469..\$1569
4.3GB ST31230N 9ms 3.5" \$1499..\$1549
9.0GB ST410800N 11.5ms 5.25" \$2549..\$2749

FAST WIDE SCSI SERIES

2.1GB ST32550W 9ms 3.5" \$1129..\$1309
4.3GB ST31510W 8ms 3.5" \$1699..\$1979
9.0GB ST410800W 11.5ms 5.25" \$3299..\$3649

IBM

1.0GB DPES-31080 10.5ms 1" \$499..\$599

HEWLETT PACKARD

FAST SCSI-2 SERIES
1.05GB C3323A 10.5ms 3.5" \$569..\$669
1.24GB C3724A 10ms 3.5" \$549..\$649
2.1GB C2490 8.9ms 3.5" \$1039..\$1139
2.17GB C3725S "NEW" 3.5" \$949..\$1049

FUJITSU

IDE & FAST SCSI-2 SERIES
530MB M2684TAU 12ms IDE \$189..\$N/A
530MB M2684SAU 12ms SCSI \$215..\$315
1.0GB M1606SAU 10ms SCSI \$469..\$569

FAST WIDE SCSI SERIES

1.0GB M2694EQA 10ms 3.5" \$669..\$939

2.5" DRIVES

Seagate

455MB ST9550AG 10mm IDE \$399
524MB ST9655AG 19mm IDE \$415

TOSHIBA

352MB MK1824FCV 127mm ATA-2 \$275
540MB MK1924FCV 127mm ATA-2 \$399
704MB MK2528FC 19mm ATA-2 \$559
810MB MK2628FC 19mm ATA-2 \$579

REMOVABLES

SyQuest

REMOVABLE CARTRIDGE DRIVES
105MB SQ3105S Int/Ext w/cart \$235/\$379
200MB SQ3200C Int/Ext w/cart \$369/\$499
200MB SQ3200C Mac Ext w/cart \$519
270MB SQ3270A IDE for PCs \$335
270MB SQ3270S Int/Ext w/cart \$339/\$469
270MB SQ3270S Mini Ext w/cart \$549
270MB SQ3270P Ext for Parallel w/cart \$599

TAPE BACKUPS

EXABYTE

EXB2501 1GB-Up to 34MB/min \$489/\$619
EXB2501K 1GB Complete Kit \$649/\$749
EXB4200 2GB-Up to 14MB/min \$799/\$899
EXB4200C 4GB-Up to 28MB/min \$799/\$899
8205XL 3.5 to 7GB-Up to 32MB/min \$1289/\$1589
8505XL 7 to 14GB-Up to 80MB/min \$1999/\$2299
EXB-EKT 5.25" Bracket for 3.5" Units \$39

HEWLETT PACKARD

35470A 2GB-Up to 11MB/min \$779/\$879
35480A 4-8GB, Up to 44MB/min \$859/\$949
1553A 4-8GB/JAW Comp. DDSE \$1019/\$1119
1553A 24-48GB/8 Cart AutoLoader \$2249/\$2399
HP-BKT 5.25" Bracket for 3.5" Units \$39

CONNER

Archive Viper 1/4" Series

2150S 250MB-Up to 7MB/min \$309/\$409
2525S 525MB-Up to 12MB/min \$459/\$559

TapeStar Series

TS420 420MB-Floppy Based \$169
TS420P 420MB-Parallel Port Backup \$319
TS580 850MB-QIC Wide-Floppy Based \$284
TS580P 850MB-Parallel Port Backup \$389
TS1700 1.7GB-QIC Wide-W/Floppy Cont \$319
TS4000 4.0GB-QIC Wide-SCSI Based \$529
TS4000E 4.0GB-QIC Wide-SCSI External \$629

FLORADO

Floppy Based Backup Units

DJ20 250MB-JUMBO 250 \$138
DJ35 350MB-JUMBO 350 \$169
DJ25 680MB-JUMBO 700 \$255
T1000 800MB-HP Colorado T-1000 \$209
DJ50 1.4GB-JUMBO 1400 "NEW" \$349

Power Tape SCSI Backup Units

PT10 1.0GB SCSI-2 1/4" \$589/\$N/A
PT25 2.0GB SCSI-2 1/4" \$929/\$1029
PT50 4.0GB SCSI-2 1/4" \$1119/\$1239
PD60 2-4GB SCSI-2 DAT \$999/\$1099

TRAKKER Parallel Backup Units

JT20 250MB-TRAKKER 250 \$269
JT35 350MB-TRAKKER 350 \$335
JT25 680MB-TRAKKER 700 \$389

WangDAT

4mm DAT SCSI Backup Units

3100 2.0GB 3.5" DDS-Up to 11MB/min \$759/\$899
3200 4-8GB DDS-DC, Up to 22MB/min \$799/\$999
3400CX 4-8GB DDS-2 22-44MB/min \$999/\$1149

SIMMS & CPUS

*Call For Lowest Price**

1x3/60-70ns	1MB 3-Chip SIMMS	\$Call
1x9/60-70ns	1MB 9-Chip SIMMS	\$Call
1x2/70ns	1MB 2-Chip SIMMS	\$Call
1x8/70ns	1MB 8-Chip SIMMS	\$Call
4x3/60-70ns	4MB 8-Chip SIMMS	\$Call
4x9/60-70ns	4MB 9-Chip SIMMS	\$Call
4x8/70ns	4MB 8-Chip SIMMS	\$Call
16x9/60-70ns	16MB 9-18Chip SIMMS	\$Call
1x36/60-70ns	4MB 72-Pin SIMMS	\$Call
1x32/60-70ns	4MB 72-Pin SIMMS	\$Call
2x36/60-70ns	8MB 72-Pin SIMMS	\$Call
2x32/60-70ns	8MB 72-Pin SIMMS	\$Call
4x36/60-70ns	16MB 72-Pin SIMMS	\$Call
4x32/60-70ns	16MB 72-Pin SIMMS	\$Call
8x36/60-70ns	32MB 72-Pin SIMMS	\$Call
16x36/60-70ns	64MB 72-Pin SIMMS	\$Call

intel

486 & Pentium CPUs
DX33/DX50 \$115/\$219
DX2-50/DX2-66 \$139/\$149
DX2-66/DX4-100 \$159/\$229
P80/P86 \$265/\$285
P75/P90 \$299/\$359
P100/P120 \$519/\$1269

AMD 486 CPUs

DX2-66(3VOLT/5VOLT) \$129/\$149
DX2-80(3VOLT/5VOLT) \$139/\$169
DX4-100 \$179

CD ROM DRIVES

PIONEER

DRU-104X 1 DISC-4X 600kb/sec \$299
DRU-124X 1 DISC-4.4X "NEW" \$329
DRM-602X 8 DISC-2X CHANGER \$389
DRM-604X 6 DISC-4X CHANGER \$799
DRM-624X 6 CD-4.4X "NEW" \$829
DRM-1804X 18 DISC-4X CHANGER \$1789
DRM-1804X 6 DISC Magazine \$29

TOSHIBA

XV3801B 4.4X-120ms-600kb \$349/\$449
XV5502B 4.4X-120ms-600kb \$219

FX-400B 4X-64K Cache-600kb \$199

PLEXTOR

PX-43CS 4X-256K Cache-600kb INT \$329
PX-45CS 4X-256K Cache-600kb EXT \$409
PX-43CH 4X-1MB Cache INT \$399
PX-45CH 4X-1MB Cache EXT \$499
PX-45CHM 4X-1MB Cache EXT MAC \$529
PX-63CS 6X-256K Cache-900kb INT \$579

CHINON

CDS-525 2X-280ms-300kb \$139/\$239
CDS-525K KIT with card & Cable \$159/\$259
CDS-545 4X-230ms-600kb IDE \$199

RECORDABLE CDs

PINNACLE MICRO RECORDERS

RCD-1000 Pinnacle 2X Ext Unit \$1695
RCD-1000 Pinnacle 2X w/Cont \$1859

SMART & FRIENDLY RECORDERS

CD-R1002 2X w/Cont & Corel \$1659
CD-R1002 4X w/Cont & Corel \$3789

TO ORDER CALL:

1-800-252-9777

HDS5 COMPUTER PRODUCTS

"Your Hard Drive & MultiMedia Super Source"

8225 Jarvis Ave., Newark, CA 94560
M-F 9A-7P; Sat 9A-5P; Sun 10A-4P PST
Tech Support: (510) 494-8048

- No Surcharge for Credit Cards.
- 30 Day Money Back Guarantee.
- Returns Accepted with RMA # only, in Original Packing & Condition.
- Returned Items for Refund are Subject to a 12% Restocking Fee.
- Memory SIMMS, CPUs, Tapes and Items that include Software are Not Refundable. Warranty Exchange only.
- All Logos are the Property of their Respective Companies.
- Certain Items May Require Special Ordering.
- Price and Availability are Subject to Change without Notice.
- Not Responsible for Types or Technical Errors.

VISA

MasterCard

Discover

PO's COD's

CORPORATE HDS5

- Pre-Approved Purchase orders for Fortune 1000 Companies & Government Agencies.
- City and Dealer Discounts are Available.
- All Educational Institutions are Welcome.
- International Orders are Welcome.

(510) 494-8100
Fax Orders to: (510) 494-8501

**Honorable
Mention**



PC Computing

TOP 10
Magna NT
August 93



pentium®
PROCESSOR



Same Day
Shipping

The Ultimate 15" MultiMedia Workstation
- 16MB RAM . 850 H.D. . 4X CD ROM DRIVE

- 256K Level-2 Cache
- 850 MB Enhanced Mode-4 IDE Hard Drive
- PCI IDE Hard Drive Controller
- PCI Graphics Engine
- 28mm. Low Radiation Color Monitor
- CD-ROM Drive & ...
- High Fidelity Amplified Stereo Speakers
- with America On Line & CompuServe
- Professional Enhanced 101-key Keyboard
- High Resolution Serial Mouse
- 2 Serial & 1 Parallel Ports
- 1.44 MB, 3.5", Floppy Disk Drive
- Professional 7-Bay Tower Case & Dual Cooling System
- MS Windows for Workgroups 3.11 & MS DOS 6.22

Pentium™ /75	\$2075
Pentium™ /90	\$2195
Pentium™ /100	\$2325
Pentium™ /120*	\$2675

At Maximus we give you the best value in the industry by combining our award winning performance system with 16 megabytes of RAM, 256K Level-2 write back cache for optimal performance.

For storage, we've installed a minimum 850 MB **Enhanced Mode-4 IDE** hard drive, coupled with a **Bus Mastered**

Enhanced Mode-4 PCI IDE controller for highest possible data transfer.

We also choose the **Award Winning ATI Mach 64** graphics accelerator card with full 2MB on-board which will display a vivid true-life quality picture on our flatscreen and low radiation color monitor.

For the richest multimedia sound we have combined great combination such as a **Quad speed CD ROM drive & a 16 bit high fidelity sound card** with an assortment of Microsoft Works, Money, Encarta '95 plus over 200 entertaining titles on CD and dual amplified stereo speakers for amazing sound.

For future expansion, all systems come with professional 7-bay tower case with dual cooling system.

CIRCLE 334 ON READER SERVICE CARD



**4 Year
G.E. On-Site
Service
Warranty
optional**

Some Day.
Shipping

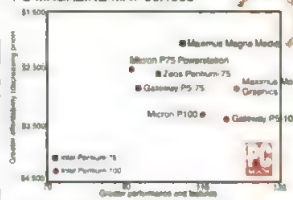
- **Built-in Double Speed CD-ROM Drive**
- **Up to 6 Hours Battery Life** with Optional External Battery
- **8 MB RAM & 340 MB Hard Disk Drive**
- **32-bit Graphics Accelerator with 1MB**
- **10.4" Dual Scan & 9.4" Active Matrix Color**
- **16-bit Sound Card, Microphone & Stereo Speakers**
- **85-key Ergonomic Keyboard**
- **Built-in Ergonomic Designed Pointing Device**
- **External 1.44 MB Micro Floppy Disk Drive**
- **Two Type II or One Type III PCMCIA Slot**
- **Enhanced Serial & Parallel Ports**
- **Optional G. E. 4 Year On-Site Warranty**

486DX4/75 \$2295**486DX4/100\$2375**

**Add \$895 for Active Matrix Color
Cell Upgrades & Accessories**



PC MAGAZINE MAY 30, 1995



The closer to the upper right corner. From the pages of PC Magazine May 30, 1995

Maximus award winning systems also come standard with lifetime labor & lifetime toll free technical support warranty, a 30-day money back guarantee plus express parts replacement & more. All with the quality you would expect from Maximus computers. That's why PC Magazine Editors in the May 30, 1995 issue rated Maximus™ Magna Media is the Most Bang for the Buck."

All Maximus Quality Systems come with Max-Advantage



1.800.888.MAXI

Pentium 170 comes with Intel Triton PC 133busset Architecture.

[illegible]

"Performance to the Max"

**PENTIUM
CD-ROM
NOTEBOOK**

 "ARMNOTE PENTIUM
NOTEBOOK IS THE FASTEST
NOTEBOOK PERIOD." APRIL 1995

tvLaptop "THE PROCESSOR PERFORMED PHENOMENALLY WELL.. I NEVER HAD TO WAIT IT WAS GO, GO."

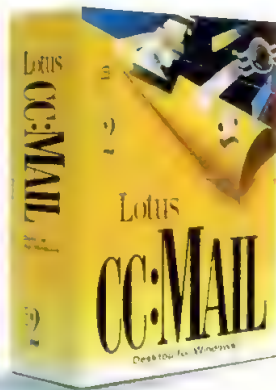
"TOP 5 MOBILE PCS"
APRIL 1995

CIRCLE 330 ON READER SERVICE CARD

Lotus® cc:Mail: The One Meeting Nobody MISSES.

Need an easy way to ensure everyone in your office gets the message? Then you need Lotus cc:Mail. With over 7 million users, it is the world's leading LAN-based e-mail system, winning the *LAN Times* Reader's Choice Award for five straight years.

Now, thanks to Stream—the merger of Corporate Software and RR Donnelley Global Software Services—you can get Lotus cc:Mail for just \$61 (sku 110236), or get the Lotus cc:Mail Upgrade for just \$36 (sku 110238)!



Or for just \$125, get cc:Mail Mobile for Windows (sku 109975), or the cc:Mail Mobile Upgrade Version 2.2 for \$36 (sku 109980); this powerful tool allows you to view over 150 kinds of attachments sent via cc:Mail! But our most attractive feature is the one that's the least obvious: expertise. Stream is the informed source, because we sell more Lotus products to more businesses than anyone else in the world.

The One Message Everybody GETS.



Lotus Fax Server \$1,279 (sku 121739)—This is the fully integrated fax solution for Lotus cc:Mail. With it, you'll be able to send, receive, view, and manipulate content-rich faxes without leaving the familiar cc:Mail environment. *Get the Lotus Fax Server Upgrade for just \$411* (sku 121741).



Lotus Organizer r.2.0 \$87 (sku 106616)—Features shared calendaring and group scheduling for Lotus cc:Mail users. Plus, personal information management—like to-do lists, important addresses, call management, and notekeeping—has never been easier. *Get the Lotus Organizer Upgrade for just \$29* (sku 116218).

Get Great Prices on Lotus cc:Mail, Lotus Fax Server, and Lotus Organizer. Plus, get special prices on volume purchases of Lotus Passport. All from Stream.

STREAMLINE YOUR COMMUNICATIONS! CALL TODAY!

1-800-699-1741

Stream

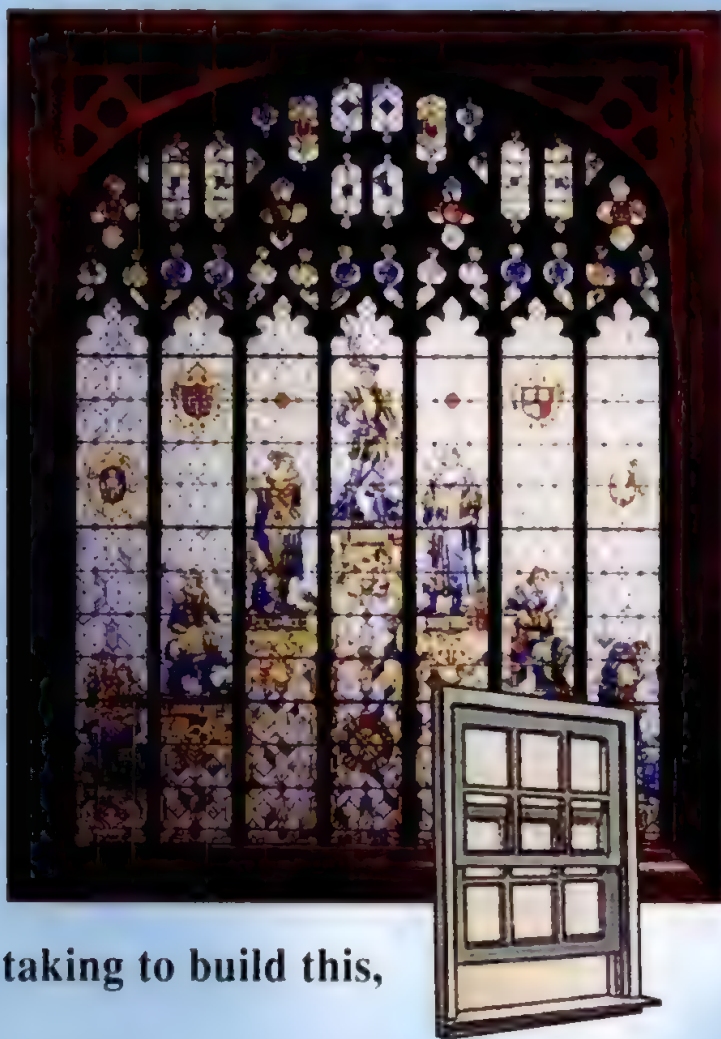
Supplies are limited. And this offer expires August 15, 1995.

Copyright 1995 Stream International. All trademarks and product names contained herein are the properties of their respective owners. All prices guaranteed through August 15, 1995. Stream International cannot be responsible for errors in typography or photography. All prices are exclusive of shipping, handling, and applicable sales tax. Any export of products is subject to applicable U.S. government regulations and will be the customer's responsibility. Guarantees and warranties may have some restrictions. Call for Canadian pricing. MasterCard, Visa, Discover, and American Express accepted. Stream International, 2 Edgewater Drive, Norwood, MA 02062-4637.

COM005

CIRCLE 315 ON READER SERVICE CARD

To create this...



in the time it's taking to build this,

use this.

CLARION

FOR WINDOWS™

Introducing Clarion for Windows™, the only Rapid Application Development environment and programming tool that delivers the promise - Productivity, Performance and Maintainability - for both 16 and 32 bit applications.

You're More Productive - because you write less code than other RAD tools. Any visual design tool can draw a user interface object. But Clarion's templates generate the functionality behind the objects, creating not just a button but a business solution, such as a look-up or a record update.

Your Applications Fly - because Clarion delivers a higher level of performance! Our optimizing compiler creates applications that perform tens of times faster than Visual Basic® or Power Builder® applications. And, going from prototype to application is quick and easy. Your end users will love it!

Maintenance is Simplified - because only Clarion's development environment is designed to cut the time needed for long-term maintenance. Change an option in the data dictionary, such as a Referential Integrity constraint, and your application is automatically updated, evolving to meet your end users' needs. Plus, Clarion is an expressive, compact language that's easy to learn and read.

Better. Faster. Smarter. That's Clarion for Windows. Call today for a **FREE TRIALPAK CD** and let us prove that Clarion delivers what it promises.

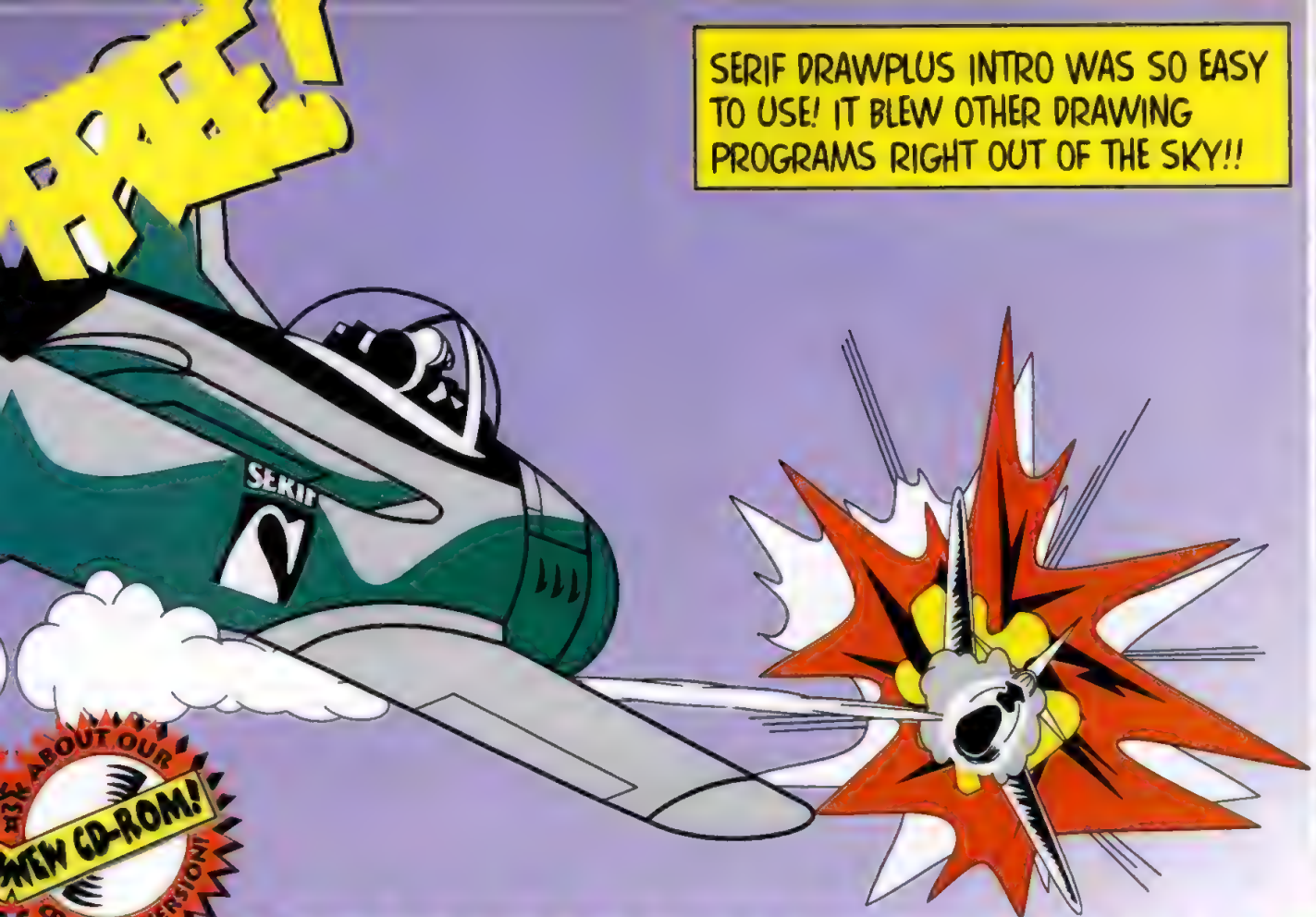
TopSpeed
CORPORATION

1-800-226-0734

Copyright © 1995 TopSpeed Corporation. All products and company names are trademarks or registered trademarks of their respective owners.

CIRCLE 303 ON READER SERVICE CARD

SERIF DRAWPLUS INTRO WAS SO EASY TO USE! IT BLEW OTHER DRAWING PROGRAMS RIGHT OUT OF THE SKY!!



THE WORLD'S EASIEST GRAPHICS & ILLUSTRATION SOFTWARE!

Are you looking for a powerful Windows drawing and illustration program - like CorelDRAW® - but you don't want the complexity and expense? Then you need new Serif DrawPlus Intro. It's incredibly easy for anyone to learn and use, and it's packed with powerful drawing features. And, best of all, it's FREE!

DrawPlus Intro gives you everything you need to get started for FREE! Based on DrawPlus 2.0, our \$99 power-packed CorelDRAW® rival, so right out of the box you'll be producing stunning logos, perfect diagrams, school posters and complete works of art in full color. And you get great results on any dot-matrix, ink-jet or laser printer - in color or b/w - or add your drawing into any Windows Word-Processor or DTP.

You'll be amazed by DrawPlus Intro. Produce attention grabbing color slides or stretch and distort text to create your own designer lettering.

Even edit and customize clipart pictures to your own unique specification. And because DrawPlus Intro has been created with the first time user in mind, you'll have no trouble quickly accessing these powerful features. There are no complex menus to worry about - just use the quick-fire, button-based control panel. You'll soon find out that it's fun, too!

What's the catch? There's no catch... DrawPlus Intro is the easiest way to find out all about illustration and graphics on your PC. Once you've used one value-packed Serif product you'll want to try the rest!

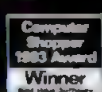
Get DrawPlus Intro today and you'll join nearly 600,000 enthusiastic Serif customers world-wide. Call NOW for your FREE* copy of amazing DrawPlus Intro! (Or ask about the new CD-ROM version with BOTH DrawPlus Intro and PagePlus Intro - including an incredible 1000 clipart images and 100 TrueType fonts - for just \$5.95!!!)

CALL NOW TO ORDER FREE SERIF DRAWPLUS INTRO:

1-800-697-3743

24-Hour Toll-Free Value Line, Open 7 Days.
Please Quote Code - PMJ - 085

CIRCLE 351 ON READER SERVICE CARD



One of the Serif family of Best-Selling, Award-winning Publishing and Graphics applications

* There is a non-refundable \$6.95 shipping and admin charge. Please have your credit card ready. Visa, MasterCard, Amex and Discover accepted. You need Windows 3.1 (not 2.0) and 2MB RAM. Serif and DrawPlus are trademarks of Serif, Inc. CorelDRAW is a trademark of Corel Corp. All other trademarks acknowledged. Please mail checks or money-orders to Serif, PO Box 803, Nashua NH 03061. (603) 880-8650. Toll-free fax (603) 889-1127. PagePlus Intro and DrawPlus Intro can be collected free from Serif in Nashua - mail for details. Limited offer while stocks last, one offer per household only. CD-ROM version is \$5.95 plus shipping. (603) 880-1127. A \$19.95 100% money-back guarantee. DrawPlus Intro can be downloaded free from the Internet - call for details. DrawPlus Intro is a 100% money-back guarantee. DrawPlus Intro is a 100% money-back guarantee. DrawPlus Intro is a 100% money-back guarantee.

This ad was designed and produced using Serif DrawPlus & other Serif products

Only
\$99.95

Intelligent Agents for the Internet.



For business people who have more important things to do than browse the Internet.

Busy people like yourself need a fast, automated approach to retrieving information from the Internet. That's where InterAp comes in. It offers a suite of Windows-based applications consisting of modules that look and work alike, including common menus, commands, and toolbars—using InterAp is easy and intuitive. But what really sets InterAp apart from other Internet products is its Intelligent Agents. They take you directly to the information you're looking for and allow you to automate time consuming and often repetitive research tasks. Each InterAp package comes standard with four agents — NetNews Wizard, Web Publisher, FTP Publisher, and Mail Publisher.



InterAp's Key Features

- **NetScripts API** Lets you create your own customized Intelligent Agents. NetScripts also lets you add the power of the Internet to your existing applications.
- **Scheduler** Schedules Intelligent Agents to access the Internet at any time, attended or unattended. You can use the power of your computer at night when Internet traffic is low and access time is fast — it's ideal for time consuming and tedious processes and searches.
- **Mail Transports** Includes transports for the Internet using TCP/IP and any MAPI compliant LAN mail system.
- **Data Security** Supports Internet firewalls and secure e-mail messaging.
- **Super FTP** Provides an OLE2 server application for dragging and dropping programs or files anywhere in the world.
- **Uncensored** Allows full membership to the Internet without information filtering.
- **International Versions** Fully localized software available in Japanese, Spanish, German, French and Russian.

If you've been wasting long, valuable hours browsing the Internet with a lower performance Internet product, give California Software a call. We'll help you get your work done.

FREE TRIAL OFFER!

Try InterAp at no cost or obligation for 30 days. Simply download InterAp from ftp.calsoft.com or call 800-830-3311 to order direct.

Also available! Instant Internet access - pay only the cost of phone charges.



Upgrade offer - Upgrade to InterAp for only \$49.95 from Chameleon, Ibox, BookLink or Onnet applications. (Requires proof of purchase.) 30-day trial w/ diskettes and documentation - \$19.95. Full single user license fee - \$99.95. InterAp is a trademark of California Software, Inc. All other names are trademarks of their respective manufacturers. California Software, Inc. 2121 E. Pacific Coast Highway, Suite 120A, Corona Del Mar, CA USA 92625-3646 Sales 800-830-3311, Fax 714-729-2272, e-mail sales@calsoft.com, Support: support@calsoft.com. © 1995 California Software, Inc.

CIRCLE 277 ON READER SERVICE CARD

What should you expect from a 21" monitor priced under \$2,000?



SuperScan Pro 21 (CM2110MU)

Everything!

You can pay more for a 21" monitor, but you won't get more. The new SuperScan Pro™ 21 includes an exceptionally fine 0.26 mm mask pitch for sharper images. It's got every convenience and control feature you can think of. It's designed for

full compatibility with Windows '95.

And with a suggested selling price under \$2,000, it delivers more value than any other premium 21" monitor. Check one out today. Call 800 441-4832 for details and your nearest dealer.

HITACHI

SuperScan

An advantage you can clearly see

Access Graphics (800) 733-8333, DSB (800) 231-4278, Gates/Arrow (800) 332-2222, Graphics Technologies (800) 999-8382, Ingram Micro (800) 458-8000, International Computer Graphics (800) 658-4244, Mervel (800) 837-4736, Tech Data (800) 337-6921. The ENERGY STAR™ emblem does not represent EPA endorsement of any product or service.

Available through **COMPUSA**
The Computer Superstore

CIRCLE 326 ON READER SERVICE CARD

THINKING

EPS

Technologies

UNIVELL
SOFTWARE
SOLUTIONS
FOR
BUSINESS
PRODUCTIVITY
PERFECTOFFICE
PERFECTOFFICE



PERFECTOFFICE

TOOLS FOR A WORLD AT WORK.

EPS Workbook Series:

- 1.44MB Floppy Disk Drive
- 1MB Video Memory
- 10.3" Dual Scan or 9.5" Active Matrix
- Built-in, 16-bit Stereo Sound Card
- Two Built-in Speakers, One Built-in Microphone
- Ext. Speaker Output, Ext. Microphone Input and Volume Control
- Two Type II or One Type III Slots
- 19mm Front, Centered Ergonomic-Style Trackball (Integrated QuickPointer on DX4-100 model)
- User-Removable Hard Drive (540 or 810 meg)
- NiMH Battery and AC Adapter
- High-Speed 16550 UART Serial Port
- MS DOS 6.22, MS Windows for Workgroups 3.11 with Documentation (Pre-Installed)
- Professional PerfectOffice Suite*
- Bi-directional EPP/ECP Parallel Port
- Lightweight, 6.4 lbs., with carrying case
- One-Year Warranty



EPS DX4-100 Notebook
4 MB RAM / 540 MB Hard Drive

\$1795

DUAL COLOR

\$2395

ACTIVE COLOR

EPS Pentium™-75 Notebook*
8 MB RAM / 540 MB Hard Drive

\$2445

DUAL COLOR

\$2945

ACTIVE COLOR

EPS Pentium™-90 Notebook*
8 MB RAM / 810 MB Hard Drive

\$2645

DUAL COLOR

\$3145

ACTIVE COLOR

EPS Pentium™-90 Notebook*
16 MB RAM / 1.2 Gig Hard Drive

\$3395

DUAL COLOR

\$3895

ACTIVE COLOR



*Novell's Professional PerfectOffice software suite included with all EPS Pentium™ systems! Applications include:

- WordPerfect 6.1
- Paradox 5.0
- Quattro Pro 6.0
- AppWare
- InfoCentral
- Presentations 3.0
- GroupWise 4.1
- Envoy

EPS Workstation Series:

- 16MB Expandable to 128MB, PCI
- 256K Cache Standard
- 1.44 MB Floppy Disk Drive
- 850MB Enhanced IDE Hard Drive
- #9 GXE PCI 64-bit 2MB Video
- 15" 1280 x 1024 Color Monitor, MPR II Low Radiation, .28 Dot Pitch
- Quad Speed CD-ROM
- Stereo sound with quality speakers
- 101 Enhanced Keyboard
- Desktop or Mid-Tower Case
- MS DOS 6.22, MS Windows for Workgroups 3.11 with Documentation (Pre-Installed)
- Professional PerfectOffice Suite*
- MS Compatible Mouse with Pad
- EPA Compliant
- 30-Day Money-Back Guarantee
- 3-Year Superior Warranty
- 1-Year On-Site Service
- Customizing Available



EPS Pentium™-75*

\$2195

EPS Pentium™-90*

\$2295

EPS Pentium™-100*

\$2395

EPS Pentium™-120*

\$2645

FOR A LIMITED TIME

Upgrade any Workstation Series System to

32MB System Ram
1.2 Gig HD
17" Digital Color Monitor

FOR ONLY

\$899

EPS Technologies

"a tradition of value and performance"

1.800.447.0921

GSA Contract #GSOOK94AGSS035-PS01 • FAX Orders 605-966-5482 • Direct Line 605-966-5586 • Technical Hotline 800-526-4258

EPS Technologies, Inc. • 10069 Dakota Avenue • P.O. Box 278 • Jefferson, SD 57038 • Hours: 7 am - 7 pm M-F, 9 am - 5 pm Sat CST

All brands and product names mentioned are trademarks or registered trademarks of their respective holders. Prices are subject to change without notice. Pentium is a trademark of INTEL Corporation.

Money Back Guarantee excludes shipping charges if returned.

CIRCLE 307 ON READER SERVICE CARD

The first modems to install themselves



Plug and Play faxmodems for Windows 3.1 and Windows 95

Supra's new Plug and Play modems are so simple to install, they virtually install themselves. Best of all, they bring Plug and Play ease to both Windows 3.1 and Windows 95!



So you'll experience quick-and-easy installation in your system today, and again when you upgrade to Windows 95! Just plug in your modem, install the accompanying software, and

you're ready to go. No more jumper hassles,

device conflicts, or time-consuming diagnostics. Configuration is automatic – just Plug and Play! And there's a Supra Plug and

Play modem designed especially for you. Choose from either the SupraExpress 144i PnP (14,400 bps) or the SupraFAXModem 288i PnP (28,800 bps).

Call 1-800-727-8417 today for the Supra reseller nearest you.



Installs in minutes

	Windows 3.1 DOS 5.0 or HIGHER	Windows 95
1	"PLUG" in faxmodem	"PLUG" in faxmodem
2	Run Supra install program	Start up Windows 95
3	Select available COMport "and PLAY"	"And PLAY"



Supra Corporation

Communications Made Simple™

CIRCLE 311 ON READER SERVICE CARD

Turn this...into this



{ in 45 minutes. }

With MyBrochures[®] for Windows,[®] all it takes is around 45 minutes to complete a brochure. You can also create business cards, flyers, postcards—everything you need to enhance your professional image—in minutes! **MyBrochures does it all in five easy steps:**

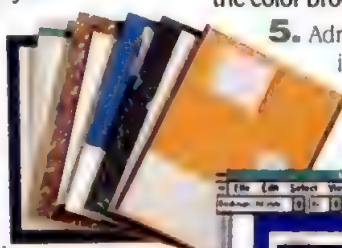
1. Choose from over 300 different designs of color printed paper. Samples and catalogs are included in the box for easy paper ordering.

2. Start typing anywhere you want on the page. There's no need to waste time formatting columns and margins—it's all automatically set up for you.

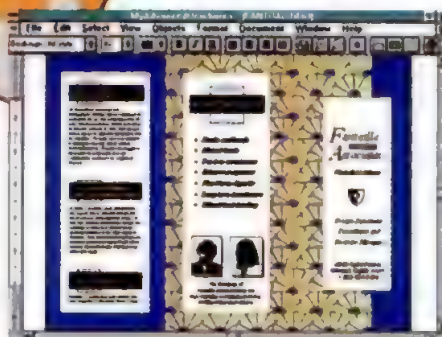
3. Add your own logos, photos and clip art—anything that tells your story.

4. When you're ready to print, put the color brochure paper in your printer.

5. Admire your work! You deserve it. It's never been easier to create a professional image for your business.



Pre-printed paper prices start at 15¢ per sheet from leading paper companies. Overnight delivery available.



Over 300 color paper designs can be displayed right on your computer screen.



There's no easier way to create your own brochures.



MyBrochures 1.0 named a "1995 Top 100" product by Windows Magazine.



Special Price ~~\$99.95~~
\$69.95

No Risk 30-day
Money-Back Guarantee

**MyBrochures
Mailers & More[™]**
for Windows[™]

To order or for more information, call

1-800-325-9095

Mention Code J5 to get special price.

MySoftware Company[®]

Over 1 million satisfied customers.



MICRO MALL DIRECT ADVANTAGE

- Huge Selection Of Memory Products
- Guaranteed Lowest Memory Prices
- Lifetime Warranty On Memory Products
- Memory Covered By IBM On-Site Warranties
- 30-Day Money Back Guarantee
- Same Day Shipping
- Over 27,000 Hardware & Software Products
- No Credit Card Surcharges
- P.O.'s Accepted From Qualified Firms
- Open Saturdays
- Great Customer Service
- International Sales Staff

To Order Call:

Toll Free (800) 346-7172

International (714) 833-3222

Fax (714) 833-3389

1-800-346-7172

Hours of Operation

Monday - Friday 9am - 5pm, PST
Saturday 7am - 4pm, PST



MICRO MALL DIRECT
16812 HALE AVENUE
IRVINE, CA 92714

Micro Mall Direct is a Subsidiary of H Co Computer Products, Inc.



TERMS:

1. VISA, MC, AMEX, DISCOVER, C.O.D., PRE-PAID, AND APPROVED P.O.'S ONLY.
2. FAX ORDERS, AND INTERNATIONAL ORDERS ACCEPTED
3. ALL RETURNS REQUIRE AN RMA NUMBER, SORRY NO SOFTWARE RETURNS.
4. ALL CREDIT CARD PURCHASES ARE VERIFIED FOR YOUR PROTECTION.

*Micro Mall will beat or match memory prices from Wang authorized companies with new merchandise actually in stock. Offer excludes Standard SIMMS. All prices are listed at the time of purchase. Due to volatility of DRAM pricing and LTC tariffs placed on some manufacturers, memory pricing may be higher than advertised. Same day shipping guarantee applies only to products in stock. 15% Restock fee on all non-detective returns. NO products may be returned after 30 days. Trademarks are the property of their respective companies. Prices are subject to change without notice. Micro Mall is a subsidiary of H Co Computer Products, Inc. Micro Mall is not responsible for errors in typography or photography.

MEGA MEMORY.....

NOW YOU CAN GET TOP QUALITY
100% COMPATIBLE

STANDARD SIMM MODULES

1X9-70.....\$36	1X36-70.....\$135
1X9(3)-60.....\$38	2X36-70.....\$290
1X9(3)-70.....\$34	4X36-70.....\$495
4X9-70.....\$124	8X36-70.....\$1099
16X9-70.....\$535	1X32-70.....\$130
1X8-70.....\$37	2X32-70.....\$275
4X8-70.....\$122	4X32-70.....\$475

H.Co. is licensed to manufacture memory modules by Wang Laboratories, the inventor of standard PC simms!

DESKTOP MEMORY

AST

Advantage Plus 486 DX/33, DX2/66	4MB MD.....\$159
	8MB MD.....\$307
Advantage Pro 486/33, SX/25, Bravo LC	4MB MD.....\$150
	16MB MD.....\$545
Bravo LC 4/66d, 50d, 33, 33s, 25s	4MB MD.....\$155
	8MB MD.....\$302
	16MB MD.....\$545
Premia	4MB MD.....\$188
	8MB MD.....\$355
	16MB MD.....\$708
Prem Serv SE 4/33	32MB MD.....\$1209
Prem 386/33TE, 486/25TE, 486/33TE	8MB MD.....\$339
Prem II 386/25, 33, 486/33, 486SX/20	8MB MD.....\$339
Premium 486/25, 25E, 33, 33E	8MB MD.....\$339
Cupid Exp.	8MB MD.....\$149

NEC

ImageReady 486/25, 33, 66	4MB MD.....\$148
	16MB MD.....\$557
PM SC/SX PLUS	2MB MD.....\$209
	4MB MD.....\$295
	8MB MD.....\$545
PM 386SX/20, 204, 16L, 2x 486/50, 33	8MB MD.....\$369
PM 386/33E, 486/25E	2MB MD.....\$140
PM 386/33L Express Te, e Series	4MB MD.....\$175
	16MB MD.....\$609

COMPAQ

ProSignia, Presario	4MB MD.....\$175
	8MB MD.....\$309
Presario 500, 700, 900	4MB MD.....\$159
	8MB MD.....\$317
	16MB MD.....\$545
	32MB MD.....\$1021
ProLiant 2000, 4000, SystemPro XL	16MB MD.....\$710
	32MB MD.....\$1427
	64MB MD.....\$2439
ProLinea M/TMTE, ProSignia VS, Presario 600/800	2MB MD.....\$95
ProLinea 4/25, 4/33, 4/50, 4/66	4MB MD.....\$175
	8MB MD.....\$309

IBM

Active 300, 500, 700	4MB MD.....\$159
	16MB MD.....\$509
502, 55SLX, 66SLX, 70-661, 70-121, P 70	2MB MD.....\$80
	4MB MD.....\$175
55SLX, 66SLX	2MB MD.....\$80
70-A21, 70-A61, 70-B21, 70-B61	2MB MD.....\$80
30/286	2MB MD.....\$90
57, 57SX, 90, 95	4MB MD.....\$179
	8MB MD.....\$344

OTHERS

ALL	ALL MODELS.....CALL
Apple	ALL MODELS.....CALL
Canon	ALL MODELS.....CALL
Dell	ALL MODELS.....CALL

Hewlett-Packard

ALL MODELS.....CALL	CALL
Sun	ALL MODELS.....CALL
Zenith	ALL MODELS.....CALL

LAPTOP MEMORY

TOSHIBA

T2100, T2050	4MB.....\$199
	8MB.....\$359
	16MB.....\$659
T2400	4MB.....\$185
	8MB.....\$355
T2200SX, T2000SX, T1600, T1850, T1000SE	4MB.....\$189
	8MB.....\$319
T3400, T3800	4MB.....\$229
	8MB.....\$349
	16MB.....\$649
T3100SX, T3200SX, T5200, T5200C, T5400, T8500	4MB.....\$149
	2MB.....\$89
	8MB.....\$349
T4400, T6400, T3300	4MB.....\$185
	8MB.....\$349
	16MB.....\$629
T1900, T1950, T4500, T4600, T4700, T4800 & T4900	4MB.....\$189
	8MB.....\$379
	16MB.....\$729

IBM

IBM RECOMMENDED

CL57SX, Thinkpad 510, 700, 700C, 720, 720C	4MB.....\$209
	8MB.....\$389
Thinkpad 220, 2300s	4MB.....\$239
	8MB.....\$410
Thinkpad 300	4MB.....\$365
Thinkpad 340, 355, 360, 730	4MB.....\$189
	8MB.....\$320
	16MB.....\$655
Thinkpad 701	4MB.....\$189
	8MB.....\$339
	16MB.....\$629
Thinkpad 750, 755	4MB.....\$209
	8MB.....\$389
	16MB.....\$619
	32MB.....\$1299
Thinkpad 710T	4MB.....\$185
	8MB.....\$317
PS Note	2MB.....CALL
	4MB.....CALL
	8MB.....CALL
PS Note 486	4MB.....CALL
	8MB.....CALL
	16MB.....CALL
L40SX, N51	4MB.....\$147
	8MB.....\$288

COMPAQ

Aero, Concerto 486	4MB.....\$219
	8MB.....\$379
	16MB.....\$181
Contura 400	4MB.....\$369
	8MB.....\$655
	16MB.....\$189
Contura 4/25 Series	8MB.....\$299
	16MB.....\$639
LTE Lite/20, 25, 25c	4MB.....\$215
	8MB.....\$395

Micro Mall Stocks Memory For All Models From Every Major System Manufacturer Including Gateway And Dell.

LTE Lite 4/25c	4MB.....\$215
	8MB.....\$399
LTE Elite	4MB.....\$175
	8MB.....\$319
	16MB.....\$539

NEC

Versa S	4MB.....\$195
	8MB.....\$319
Versa E, M, V, P	4MB.....\$189
	8MB.....\$339
	16MB.....\$629
	32MB.....\$1299
Ultra Lite Versa	4MB.....\$225
	8MB.....\$399
	16MB.....\$799
UltraLite II SL/25c	2MB.....\$129
	4MB.....\$219
	8MB.....\$359
UltraLite SL/20 SL/20P	4MB.....\$197
	8MB.....\$257

CANON

CANON RECOMMENDED

NoteJet 486 50C, 75C	4MB.....\$249
	8MB.....\$409
	16MB.....\$779
NoteJet 486 (Original)	NoteJet II 486C
	4MB.....\$199
	8MB.....\$399
NoteJet 486-33, 33c, 25c, Innovate 486 NX	4MB.....\$239
	8MB.....\$399

OTHERS

Apple Powerbooks	ALL MODELS.....CALL
Ti TravelMate 4000	4MB.....\$189
	16MB.....CALL
AST Ascentia 800n	4MB.....\$185
	8MB.....\$359
	16MB.....\$689
AST Ascentia 900n	4MB.....\$205
	8MB.....\$355
	16MB.....\$609
AST PremExec	4MB.....\$159
AST PowerExec	4MB.....\$179
	16MB.....\$789
AST Bravo NB 486	4MB.....\$205
	16MB.....\$947

PRINTER MEMORY

Brother	ALL MODELS.....CALL
Canon	ALL MODELS.....CALL
Compaq Pagemark 15, 20	4MB MD.....\$000
	8MB MD.....\$000
	16MB MD.....\$000
	32MB MD.....\$000
Epson Action Laser II, EPL 8000	2MB MD.....\$129
	4MB MD.....\$205
Epson EPL 6000	4MB MD.....\$1199
HP Laserjet II II0 II0 II0 II0	2MB MD.....\$95
	4MB MD.....\$169
HP Laserjet 4L	1MB MD.....\$49
HP Laserjet 4 4M, 4P 4s, 4sdx	4MB MD.....\$179
Ilse XL 300, DJ 1200C, Design Jet 600	4MB MD.....\$351
HP Deskjet 500, 500C, 520, 520C, 550C, 560, 560C	2MB MD.....\$59
	3MB MD.....\$109
IBM 4019, 4019e	2MB MD.....\$169
IBM 4029, 4029s, 4079	2MB MD.....\$89
	4MB MD.....\$159
NEC Silent Writer 95, 97	2MB MD.....\$100
Oni Lasers	ALL MODELS.....CALL
Panasonic 4420, 4450, 4410, 4430	4MB MD.....\$119
	8MB MD.....\$189

POWER PERIPHERALS

PERIPHERALS ALONG WITH YOUR MEMORY UPGRADES!



HARD DRIVES

CONNER

540MB IDE CFS540A	12MS	\$195
850MB IDE CFS850A	12MS	\$245
1.0GB SCSI CFP1080S	11MS	\$475
2.1GB F/W SCSI CFP2107S	8 SMS	\$995

QUANTUM

540MB IDE QUL7540A	11MS	\$215
730MB IDE QUL7730A	11MS	\$245
1.0GB SCSI QUL81080S	9 SMS	\$475

SEAGATE

545MB IDE ST3680A	14MS	\$185
1.0GB IDE ST31220A	12MS	\$319
4.2GB SCSI ST31520N	9MS	\$1205

WESTERN DIGITAL

540MB IDE AC2540	11MS	\$195
730MB IDE AC2700	10MS	\$225
1.0GB IDE AC31000	10MS	\$335
1.2GB IDE AC31200A	10MS	\$355

2.5" NOTEBOOK

352MB IDE MK1824SCV	13MS	\$285
540MB IDE MK1924SCV	13MS	\$385
810MB IDE MK2628SCF	13MS	\$545

PROPRIETARY NOTEBOOK DRIVES

MICRO MALL NOW OFFERS AN EXCLUSIVE LINE OF PROPRIETARY NOTEBOOK HARD DRIVES FROM H.C.O. COMPUTER PRODUCTS, INC. THE DRIVES TAKE ADVANTAGE OF THE PROPRIETARY DESIGN USED BY THE OEM, AND SIMPLY SLIDE IN FOR QUICK INSTALLATION.

CANON NOTEJET II 528MB 710MB 810MB	CALL
IBM THINKPAD 355 360 750 755 528MB	CALL
IBM THINKPAD 355 360 750 755 710MB	CALL
IBM THINKPAD 355 360 750 755 810MB	CALL
NEC VERSA E.M.V.P. 528MB 710MB 810MB	CALL
TOSHIBA 4700CT 4800 4850 4900 528MB	CALL
TOSHIBA 4700CT 4800 4850 4900 710MB	CALL

TAPE BACKUP

CONNER

TAPESTOR 4000 4GB INT IDE W/TAPE	\$605
TAPESTOR 1700 1.7GB INT W/TAPE	\$385
TAPESTOR 850 850MB INT W/TAPE	\$320
TAPESTOR 420 420MB INT W/TAPE	\$175

COLORADO MEMORY SYSTEMS

TRUNKER 700 700MB EXT W/TAPE	\$325
JUMBO 700 700MB INT W/TAPE	\$205
TRUNKER 350 350MB EXT W/TAPE	\$265
JUMBO 350 350MB INT W/TAPE	\$135

MODEMS

U.S. ROBOTICS

COURIER EXTERNAL V.34 28.8 DATA/14.4 FAX	\$419
COURIER INTERNAL V.34 28.8 DATA/14.4 FAX	\$379
SPORTSTER EXT V.34 28.8 DATA/14.4 FAX	\$244
SPORTSTER INT V.34 28.8 DATA/14.4 FAX	\$227
SPORTSTER EXT 14.4 DATA/14.4 FAX	\$109
SPORTSTER INT 14.4 DATA/14.4 FAX	\$99

PRACTICAL PERIPHERALS

PC288C EXT 28.8 DATA/14.4 FAX 3-LINE	\$339
PC288M1 EXT 28.8 DATA/14.4 FAX	\$275
PC288C INT 28.8 DATA/14.4 FAX	\$259
PC144MT EXT 14.4 DATA/14.4 FAX	\$132
PC144C INT 14.4 DATA/14.4 FAX	\$119

PCMCIA

ACTION TEC

1MB SRAM Card With 2K Attribute	\$135
2MB SRAM Card With 2K Attribute	\$229
2MB Flash Card	\$149
4MB Flash Card	\$229
8MB Flash Card	\$369
16MB Flash Card	\$649
14.4/11.4 Fax/Modem	\$129
28.8/14.4 Fax/Modem	\$279
10-Base T Network Adapter	\$139
Internal Desktop Card Reader	\$135
SCSI II PCMCIA Adapter	\$129

MEGAHERTZ

14.4/11.4 X-JACK Fax/Modem	\$175
----------------------------	-------

28.8/14.4 X-JACK Fax/Modem	\$365
Ethernet/14.4 Fax-Modem Combo	\$389

IBM

20MB Flash Card Type 1	\$935
30MB Flash Card Type 2	\$1345
40MB Flash Card Type 2	\$1720

PCMCIA HARD DRIVES

340MB Hard Drive Type III (Stacked)	\$399
262MB Toshiba Type III	\$475
105MB Toshiba Type III	\$295

AXONIX

PCMCIA CD-ROM

AXONIX PROMEDIA PRODUCTS ARE EASY TO INSTALL AND CAN PROVIDE SOUND & MULTIMEDIA TO YOUR LAPTOP COMPUTER SYSTEM. THE PROMEDIA PLAYER HAS BUILT IN 16-BIT SOUND, AND AMPLIFIED SPEAKERS. THE PROMEDIA READER IS CD-ROM ONLY AND WORKS GREAT WITH SYSTEMS THAT ALREADY HAVE BUILT IN MULTIMEDIA CAPABILITIES.

PROMEDIA PLAYER MULTIMEDIA CD-ROM	\$539.00
PROMEDIA READER CD-ROM	\$295.00

CPU UPGRADES

EVERGREEN

286 16-16 MHz TO 486 50/66 MHz 10K Cache	\$209/229
386SX 16/20/25 (X2) TO 486 33/40/50 MHz 8K Cache	\$129
386SX 16/20/25 (X2) TO 486 33/40/50 MHz 8K Cache	\$129
386SX 16/20/25 (X3) TO 486 48/60/50 MHz 16K Cache	\$219
386SX 16/20/25 (X3) TO 486 48/60/50 MHz 16K Cache	\$229
386SX 25/33 MHz (X3) TO 486 50/66 MHz 16K Cache	\$279
386SX 33 MHz (X3) TO 486 66 MHz 16K Cache	\$489

TI

386DX-33 MHz (X1) TO 486 33 MHz	\$129
386DX-40 MHz (X1) TO 486 40 MHz	\$149

INTEL

486DX/SX TO Pentium 63MHz (Must Have Socket)	\$365
486DX/SX TO Pentium 63MHz (X3) 486-100 MHz	\$250
486DX/SX 25 MHz (X3) 486-75 MHz	\$160
486DX/SX 33 MHz (X2) 486-66 MHz	\$152
486DX/SX-25 MHz (X2) 486-50 MHz	\$115

MULTIMEDIA

CREATIVE LABS

SOUNDBLASTER 16 VALUE EDITION	\$95
SOUNDBLASTER 32 AVE 16-BIT WITH WAVEFILE	\$265
SOUNDBLASTER 32 AVE VALUE EDITION	\$149
SOUNDBLASTER 16 SCSI II WITH ADV SIG PROCESSING	\$195
DISCOVERY CD 16 & CD-ROM 220MS MPX2	\$339
MULTIMEDIA HOME & CD-ROM 220MS SB16 VALUE	\$409

NEC

CDR-502 MULTIPIN 50 INT CD-ROM 145MS	\$489
CDR-602 MULTIPIN 60 EXT CD-ROM 145MS PCMCIA	\$565

SONY

CSO-780C 4X IDE CD-ROM 250MS INT W/SW	\$239
CSO-780S 4X SCSI CD-ROM 190MS INT W/SW	\$305
SRS-68PC STEREO SPKR SYSTEM WITH 10W AMP	\$129

TURTLE BEACH SYSTEMS

PERFORMER 4X INT CD-ROM/TROPEZ SHD CDR SPKR	\$499
---	-------

MONITORS

CANON

US-0005 15" 28MM 1024X768	\$350
US-0006 17" 28MM 1024X768	\$645

MAG

DX15F 15" 28MM 1280X1024 MPR2	\$355
DX17F 17" 26MM 1280X1024 60HZ	\$650
MXP17F 17" 26MM 1600X1280 60HZ	\$895
MXP21F 21" 28MM 1600X1280 60HZ	\$1685

NEC

XE15 15" 28MM 1024X768 75HZ	\$575
XE17 17" 28MM 1024X768 75HZ	\$1045
XP15 15" 28MM 1280X1024 75HZ	\$605
XP17 17" 28MM 1280X1024 75HZ	\$1075

SONY

CPD-1425 14" 28MM 1024X768 60HZ	\$318
CPD-173F 17" 25MM 1280X1024 60HZ	\$905

VIEWSONIC

V15ES 15" 28MM 1024X768 75HZ	\$375
------------------------------	-------

V17GA 17" 27MM 1024X768 60HZ	\$875
V20G 20" 28MM 1600X1280	\$1315

SCANNERS

MICROTEK

SCANMAKER MP 1200DP 24-BIT 16.7M COLOR	\$795
SCANMAKER TE 6000PI 600 7M COLOR P/SHOP	\$2400
SCANMAKER II 6000PI 24-BIT 16.7M COLOR	\$450

HEWLETT PACKARD

SCANJET 3C 6000PI 24-BIT COLOR	\$975
SCANJET 3P 12000PI 8-BIT GREYSCALE	\$335

CANON

IX 3010 1200DPI 8-BIT GREYSCALE	\$315
IX 4015 6000PI 24-BIT 16.7M COLOR	\$735

PRINTERS

CANON

BJ-2000 BUBBLEJET 720X60 240CPS	\$235
BJ-70 COLOR BUBBLEJET 720X60 340CPS	\$355
BJ-600E COLOR BUBBLEJET 720X60 240CPS	\$489
BJ-4000 COLOR BUBBLEJET 720X60 340CPS	\$369
LBP 430W LASER 4PPM IMAGE REFINEMENT 3000PI	\$445
LBP 1260 LASER 12PPM POLS. POSTSCRIPT 6000PI	\$1285

EPSON

LQ-570 24PPM 260CPS (QUET)	\$259
ACTION LASER 1600 6PPM 2MB RAM	\$780

HEWLETT-PACKARD

DESKJET 540 MONOCHROME INKJET 600X300	\$290
DESKJET 680C COLOR INKJET 600X300	\$489
DESKJET 1200C COLOR INKJET POLS 600X300	\$879
DESKJET 1200CPS COLOR POSTSCRIPT 600X300	\$1599
LASERJET 4L 4PPM 3000PI POLS	\$529
LASERJET 5P 6PPM 6000PI POSTSCRIPT	\$959
LASERJET 4+ 12PPM 6000PI POLS L2	\$1469
LASERJET 4V 16PPM 6000PI 4MB RAM	\$1909

OKIDATA

ML580 24PPM 380CPS	\$429
OKI400E LASER LED 4PPM 512K RAM	\$415
OKI400E LASER LED 4PPM 2MB RAM	\$635
OKI110 LASER LED 8PPM 2MB RAM	\$825

NOTEBOOKS

CANON

NOTEJET 486C-33 DS CLR 340HD PRINTER 4MB	\$2100
NOTEJET 486C-75 DS CLR 520HD PRINTER 8MB	\$3615
NOTEJET 486C-100 DS CLR 810HD PRINTER 8MB	\$3815
PIVOTIA BOOK 200LS DS CLR D2-48 340HD 4MB	\$2455
PIVOTIA BOOK 200LS DS CLR D24-100 520HD 8MB	\$4035

TOSHIBA

T2100C DS CLR 486DX2-50 250HD 4MB RAM	\$1445
T2100CS DS CLR 486DX2-50 330HD 4MB RAM	\$2085
T2100CT ACTIVE CLR 486DX2-50 330HD 8MB RAM	\$2775
T3600CT ACTIVE CLR 486DX2-50 500HD 8MB RAM	\$3365
T4850CT ACTIVE CLR 486DX4-75 500HD 8MB RAM	\$3365
T4850CT ACTIVE CLR 486DX4-75 810HD 8MB RAM	\$3485
T4900CT ACTIVE CLR PENTIUM-75 772HD 8MB RAM	\$4815

IBM

TP 360CZ ACTIVE CLR 486DX2-50 540HD 4MB RAM	\$3255
TP 360CSE DS CLR 486DX2-50 340HD 4MB RAM	\$2575
TP 360CSE DS CLR 486DX2-50 540HD 4MB RAM	\$2695
TP 701CS DS CLR 486DX2-50 540HD 4MB RAM	\$4995
TP 701CS DS CLR 486DX2-50 540HD 4MB RAM	\$3685
TP 755C ACTIVE CLR 486DX2-50 540HD 4MB RAM	\$3550
TP 755C ACTIVE CLR 486DX4-75 540HD 4MB RAM	\$4085
TP 755C DS CLR 486DX4-100 540HD 8MB RAM	\$4305
TP 755CZ ACTIVE COLOR PENT 75 540HD 8MB RAM	\$8355

Micro Mall Carries
More Than 27,000
Hardware And
Software Products
From 650 Major
Manufacturers At
Wholesale Prices

WINDOWS 95.
AVAILABLE AUGUST 24TH

PLACE ORDERS EARLY FOR
PRIORITY SHIPMENT

SPECIALS

WINDOWS 95 UPGRADE \$82

WINDOWS 95 FULL VERSION \$175

SPECIALS REQUIRE 8MB OR HIGHER MEMORY PURCHASE

Micro Mall Proudly
Distributes Products
From The Following
Manufacturers, And
Many More....

Global Information Access and Integration at the Desktop.



Everything you need to manage the Internet.

INTERNET Chameleon™ 4.5 is all you need to access information and communicate around the globe. • Web Browser • ECCO Internet Address Book • Email • Newsgroups • BBS • Telnet • Gopher • FTP • Integrated with ECCO Pro

And everything you want to automate your life.

ECCO™ PRO 3.0 is a powerful, easy-to-use information management and integration tool that organizes your daily work and information. • Calendar and Scheduler • Contact Management • Group Scheduling • Dynamic Outline Notes • Internet Address Book with Over 2,000 Web, FTP, and Gopher Sites • Integrated with Internet Chameleon

NETMANAGE™

1-800-558-7656

Call for the name of a Reseller near you.

World Wide Web: www.netmanage.com

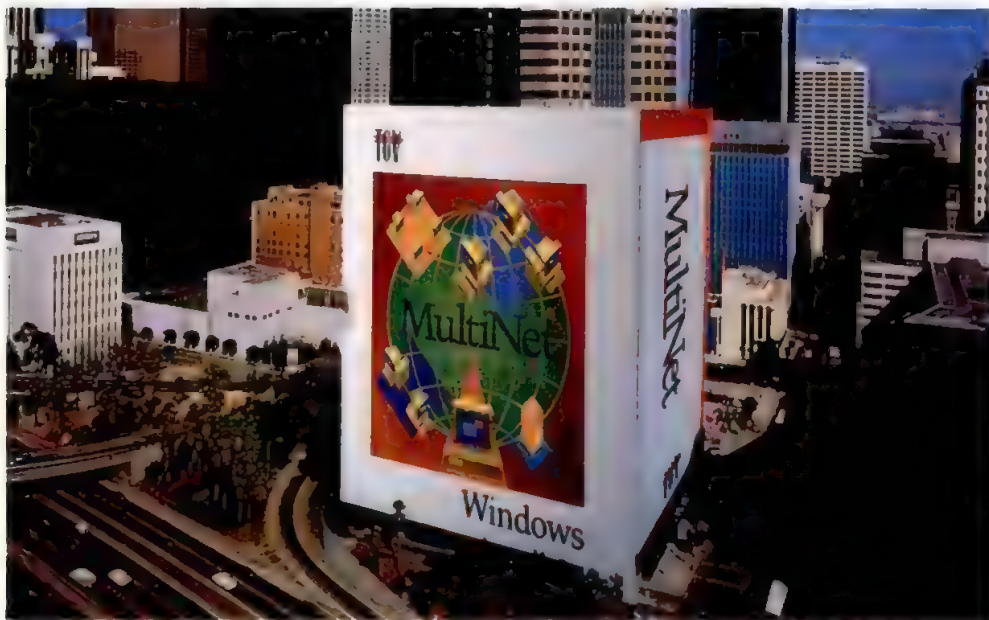
CIRCLE 323 ON READER SERVICE CARD



**ECCO™ PRO and
INTERNET Chameleon™
give you Global
Information Power!**

©1995 NetManage Inc., 10725 North De Anza Blvd., Cupertino, CA 95014 U.S.A. Fax: (408) 257-6405.
UK: +44 (0) 1483 302333; Israel: +972 (0) 4-550234; Germany: +49 (0) 8165 923 300; France: +33-1-47 72 06 08.
Specifications are subject to change without notice. All trademarks are property of their respective companies. Internet Chameleon, ECCO, WebSurfer, and NetManage are trademarks of NetManage, Inc.

THE FIRST WINDOWS TCP/IP POWERFUL ENOUGH FOR THE ENTERPRISE



Now from the experts in enterprise TCP/IP comes the first Windows TCP/IP solution that delivers the highest performance, outstanding reliability and intuitive ease-of-use that enterprise networks demand.

At the heart of MultiNet® is a robust 32-bit TCP/IP kernel that's been running in enterprise production environments for 13 years. Which is to say it's very fast and very stable.

With its native VxD TCP/IP stack, unique Deferred Procedure Call (DPC) architecture and optimized Winsock API, you can run multiple applications at maximum speed with minimal overhead.

Best of all, MultiNet is easier to install, manage, use and support than any other Windows TCP/IP product. It includes a Configuration Wizard, context-sensitive help and network diagnostics.

So if you've been looking for the one Windows TCP/IP solution you can trust to run on your client-server networks, call 1-800-TGV-3440 today.

"TGV has redefined TCP/IP for Windows. MultiNet establishes new benchmarks for speed, compatibility and range of services."

David Shute,
Internet Publishing Consultant
The Publishers, Inc.

MultiNet Applications

Terminal emulation	Network printing
Telnet & rlogin	LPR
TN3270	Stream
VT100-320	(Reverse Telnet)
Graphical keyboard	PCNFS
remapping	Network diagnosis
Kerberos	Monitor application
File sharing	Packet utility
FTP client	Network utilities
FTP server	Ping
NFS client	Traceroute
Internet access	Natlookap
WWW browser	Whois
Email-SMTP, POP	Finger
MIME	



The Experts in Enterprise TCP/IP

Tel: 408-457-5200 Fax: 408-457-5205 Email: sales@tgv.com Web Server: <http://www.tgv.com>

© 1995 TGV, Inc. MultiNet is a registered trademark of TGV Software, Inc. All other trademarks are the property of their respective owners.

WINDOWS TCP/IP

Turn it on with **Media • On**

Shopping with Media•On It's as simple as...

1.

MP66 / 75 System Featuring

- INTEL Pentium® 66/75Mhz Processor
- 8 MB RAM
- 540 MB Hard Disk Drive
- 1.44 MB 3.5" Floppy Diskette Drive
- 32-bit PCI VGA Card
- 4x-Speed CD ROM Drive
- 16-bit Stereo Sound Card
- 2 Low Distortion Speakers
- 15" Non-Interlaced SVGA Monitor
- Serial Mouse
- 101 Keyboard
- Internal Fax / Data Modem 14.4K baud
- MS DOS® & MS Windows®

\$1,789.00/\$1,889.00

MP100 System Featuring

- INTEL Pentium® 100Mhz Processor
- 16 MB RAM
- 840 MB Hard Disk Drive
- 1.44 MB 3.5" Floppy Diskette Drive
- 64-bit PCI VGA Card with 1 MB RAM
- 4x-Speed CD ROM Drive
- 16-bit Stereo Sound Card
- 2 Low Distortion Speakers
- 15" Non-Interlaced SVGA Monitor
- Serial Mouse
- 101 Keyboard
- Internal Fax / Data Modem 14.4K baud
- MS DOS® & MS Windows®

\$2,009.00

MP120 System Featuring

- INTEL Pentium® 120Mhz Processor
- 16 MB RAM
- 1.2 GB Hard Disk Drive
- 1.44 MB 3.5" Floppy Diskette Drive
- 64-bit PCI VGA Card with 1 MB RAM
- 4x-Speed CD ROM Drive
- 16-bit Stereo Sound Card
- 2 Low Distortion Speakers
- 15" Non-Interlaced SVGA Monitor
- Serial Mouse
- 101 Keyboard
- Internal Fax / Data Modem 14.4K baud
- MS DOS® & MS Windows®

\$2,929.00



2

...Risk Free 30 Days

MONEY B A C K GUARANTEE*

3

GET FREE

Popular CD Titles



and many others



47703 Fremont Blvd. • Fremont, CA 94538

CALL Today: **1. 800. 552. 7835**



Note, INTEL Inside Pentium® Processor Logo and Pentium® are registered trademarks of INTEL Corporation. MS-DOS, Microsoft®, and Windows® are registered trademarks of Microsoft Corporation. All other names are properties of their respective owners. "30 Days money back guarantee" does not include return freight and original shipping/handling charges, and begin from date of shipment. All returns require RMA numbers and must be shipped in the original condition prepaid and insured. All non-defective returns are subject to restocking fee. Prices and specifications are subject to change without notice.

CIRCLE 290 ON READER SERVICE CARD



FUTURE MICRO

World Leader in PC Upgrades



Pentium Mother Board Upgrades

Intel Premiere II

3 PCI, 5 ISA, 256k Cache
PCI Enhanced IDE, FDD, 2 Ser, 1 Par, Built In
AMI Flash BIOS, Intel Nephthys Chipset
90/100MHz \$349/399
Call for Info on Intel Premiere III

Super P54CI

4 PCI, 4 ISA Slots, 2 PCI IDE Controllers
Opti Viper Chipset, AMI Flash BIOS
90/100/120MHz
256/512/1024k Cache \$265/329/399
w/Adaptec 7850 SCSI-II \$379

Super P55CWA w/Intel VRM

Universal Motherboard Architecture
4 PCI, 4 ISA Slots, 2 PCI IDE Controllers
Intel Triton Chipset, AMI Flash BIOS
75-133MHz, Supports EDO Memory
256 to 512k Cache \$299
Super P55CWS (Pipeline Burst Cache) \$338

GA-586AT PCI-ISA

3 PCI, 4ISA, 2 IDE Channels, 1 FDD
2 16550 Ser, 1 ECP/EPP Par
256k Cache Exp. to 512k
AWARD BIOS, Intel Triton Chipset
75-150MHz \$319

GA-586ID PCI/EISA DUAL PROCESSOR

3 PCI, 5 EISA, 1 or 2 Pentium CPU's
Exp to 196MB, 256k Cache Exp. to 512k
AwardFlash BIOS, IntelChipset 90/100MHz/\$650

P54 PCI

4 PCI, 4ISA 256k Cache Exp. to 512k
AMI BIOS, SIS Chipset
90/100MHz \$199

486 MOTHERBOARDS

GA-486VF/V5

Uses (8) 30 Pin SIMMs (VF) or (4) 72 Pin (V5)
3 VL Slots, 7 total, 256k Cache, Exp. to 512k
Award BIOS, SIS Chipset, 3.3/5 Volt
Deep Green, Accepts all 486 Chips & P24T S125 w/S125
S205

GA-486AM PCI

3PCI, 4 ISA
Built in PCI IDE & Hi-Speed I/O
256k Cache, Exp. to 1024k
Award BIOS, UMC Chipset, Deep Green
3.3/5 Volt Switchable
Accepts all 486 Chips & P24T \$175

BAREBONES

Super P55CWA Bare Bones

Mid Tower Case w/Digital Display, 7 Bays
2 PCI IDE, 2 Ser, 1 Par, 1 Game
Triton PCI SVGA 1MB, 256k Cache
Pentium 90/100 \$829/957
w/1.44 Floppy add \$35

GA-486VF/V5 Bare Bones

Mini Tower Case w/Digital Display, 5 Bays
VLB IDE-I/O, 2 Ser, 1 Par, 1 Game
Triton VLB SVGA 1MB, 256k Cache
486DX2-66/100 \$379/439
w/1.44 Floppy add \$35 PCI add \$50
Call for Custom Bundles

CPU CHIPS

CALL FOR LATEST PRICING

Intel
Pentium 90/100/120 \$399/495/CALL
Pentium 60/66/75 199/279/349
P24T(Pentium Overdrive) 63/83MHz \$389/CALL
486DX4-75/100 \$219/239
486DX2-66 \$149
486DX2-50 \$135
486DX-50 \$199
486DX-33 \$89
486SX2-50 \$105
486SX-25/33 \$47/65
OverDrive ODP/ODPR CALL
AMD/Cyrix
486DX4-100 \$175
486DX2-80 \$153
486DX2-66 \$129
486DX2-50 \$119
486DX-40 \$107
Cyrix 386 to 486 Upgrades
486DX2-25/50 \$199
486DX2-33/66 \$250
486SX2-25/50 \$199

MEMORY

CALL FOR LATEST PRICING

72 Pin SIMMs
1 X 36 60/70/80ns (4mb) \$175/159/149
1 X 32 60/70/80ns (4mb) \$157/149/142
2 X 36 60/70/80ns (8mb) \$345/335/319
2 X 32 60/70/80ns (8mb) \$325/305/299
4 X 36 60/70ns (16mb) \$545/529
4 X 32 60/70ns (16mb) \$495/479
8 X 36 60/70ns (32mb) \$1100/1000
8 X 32 60/70ns (32mb) \$1050/950
30 Pin SIMMs
1 X 3 60/70/80ns (1mb) \$45/40/39
1 X 9 60/70/80ns (1mb) \$45/42/39
4 X 3 60/70ns (4mb) \$135/130
4 X 9 60/70/80ns (4mb) \$149/142/138
16 X 9 60/70ns (16mb) CALL
DRAM & VRAM
256k X 4 70/80ns, 1 X 1 70/80ns \$6
256k X 4 70/80ns 28 Pin ZIP \$11
256k X 16 70ns ZIP/SOI CALL
Cache (Call for parts not listed)
32k X 8 15/20/25ns \$8/7/7
128k X 8 15/20/25ns Slim/Wide \$36/34/30

Our sales staff is ready to provide advice on the most cost-effective 486 or Pentium upgrades for your computer.

We will buy CPU's and used or defective memory chips. Cash, Trade or Credit toward future purchase.

Future Micro, Inc. 2091 Richter Ave #118, Irvine CA, 92714

(714) 622-9130 FAX (714) 622-9143

Customer Service/Tech Support (714) 622-9999

30 Day Money Back Guarantee

Terms and Conditions: 20% Restock fee on non-defective returns. No returns after 30 days. Shipping charges are non-refundable. Not responsible for typographical errors. Prices subject to change without notice. Two year warranty on non-memory products. Lifetime warranty on memory. RMA required for all returns.

CALL THE WINDOWS 95 HARDWARE UPGRADE EXPERTS

MONTHLY SPECIALS

Super P55CWA

w/90/100/120MHz \$665/779/CALL
Quad Spin 4X CD/Sound Blaster 16
and Speakers \$299
Call for Specs and Options
540MB/1GB-IDE ..\$199/359
CALL FOR INFO ON OUR DAILY SPECIALS AND BLOWOUTS

GA486VF/V5

30 or 72 Pin Version w/Fan
w/486DX4-100 \$299
w/486DX2-80 \$275
w/486DX2-66 \$249
w/486DX33 \$189
w/486SX25 \$159

VIDEO

Triton PCI/VLB/ISA 1MB \$79
Cirrus Logic 5428 PCI/VLB 1/2MB \$79/\$136
S3 32 Bit PCI/VLB 1/2MB \$77/\$140
Diamond
Stealth 64 PCI/VLB Video VRAM 2/4MB \$315/499
Stealth 64 PCI/VLB DRAM 1/2MB \$159/\$209
Speedstar 64 PCI/VLB/ISA 1/2MB \$155/\$205
Viper Pro PCI/VLB 4MB \$579
ATI
Mach 64 VRAM PCI/VLB 2/4MB \$309/499
Mach 64 DRAM PCI/VLB 1/2MB \$199/239

MULTIMEDIA

Sound Boards

Creative Labs
Sound Blaster 16 MCD \$89
Sound Blaster 16 SCSI-2 \$135
Sound Blaster 16 ASP MCD \$209
Sound Blaster 16 ASP SCSI-2 \$239
Sound Blaster AWE 32 \$295
Sound Blaster AWE 32 VE \$250

CD-ROM Drives

Toshiba
3601 SCSI 4X Int \$309
Mitsumi
2X Internal w/Controller \$119
4X Internal IDE \$199
Tec
CD-55A 4X w/Controller \$199
External SCSI-CD/Hard Drive Cases w/Power
Single/Double Bay \$89/137

MODEMS

BEST DATA

14.4 Int Fax/Modem \$65
28.8 Int Fax/Modem \$119
14.4/28.8 Int Voice Fax/Modem \$89

HARD DISK CONTROLLERS

IDE

ISA IDE/I/O \$15
ISA IDE/I/O Enh Par & 16550's \$39
VLB IDE/I/O \$25
VLB IDE/I/O Enh Par & 16550's \$39
VLB IDE Cache Ok/1MB \$119/\$149
PCI IDE \$29
PCI IDE/I/O Combo \$55
PCI IDE Cache \$185

SCSI

Adaptec
AHA-2940W PCI \$339
AHA-2940 PCI \$249
AHA-2842 VLB \$255
AHA-2742 EISA \$295
AIC-6360 VLB \$125
SLIM SCSI \$279
AMM-1570 SCSI w/Audio \$299

HARD DRIVES

Maxtor 2yr Warranty

7240A 420MB 12ms IDE \$189
7540A 540MB 8 5ms IDE \$199
7540S 540MB 8 5ms SCSI \$279

Western Digital 3yr Warranty

2420 420MB 12ms IDE \$189
2540 540MB 11ms IDE \$199
2700 730MB 10ms IDE \$250
31000 1080MB 10ms IDE \$369

Conner 2yr Warranty

420A 420MB 13ms IDE \$179
540A 540MB 12ms IDE \$210
850A 850MB 10ms IDE \$335
1275A 1.3Gig 10ms IDE \$470
2105S 2.1Gig 9ms SCSI \$999

We also carry

Seagate, Quantum & Micropolis



All Major Credit Cards Accepted.

No surcharge on Credit Cards

LASER PRINTER/MEMORY

HP II, III & HP II, III, III, III, III, III
1MB \$69, 2MB \$95, 4MB \$169
HP41 1MB \$50
HP4 Series 2MB \$85, 4MB \$165, 8MB \$335
Panasonic 4410, 4430
2MB \$115, 4MB \$185
Panasonic 4420, 4450I
2MB \$115, 4MB \$185
Epson, Canon, IBM & More CALL

We Also Carry: Cans, Floppies, Keyboards, Mice
Ethernet, Laptop Acc. and Much More! Upgrades
for All Major Brands, Including Packard Bell

THE FUTURE MICRO DIFFERENCE

- Easy Installation Instructions
- Free Technical Assistance
- 30 Day Money Back Guarantee
- Overnight Delivery Available
- Strongly Support Corporate, Gov't and Educational Business
- Gov't. Educational Discounts

Call Our Highly Trained Sales Staff at

800-710-6502

For Expert Advice On Your PC Upgrade

CIRCLE 283 ON READER SERVICE CARD

NEW SYSTEM



**New Breed
120 MHZ
Pentium
Multimedia
System.
Only \$2999!**

60	\$2259
75	\$2359
90	\$2399
100	\$2549

- 16MB RAM
- 1.2GB Hard Drive
- 256KB Cache
- Diamond Stealth 64 PCI 2MB Accelerator
- PCI Fast IDE Interface
- 15" SVGA .28 Monitor
- MidTower Case
- 3.5 1.44MB Disk Drive
- 4x CD ROM
- 16 bit Stereo Sound Card
- 14.4 Fax/Modem w/Voice
- Speakers, Microphone, Joystick

NEW BREED

Windows95™ is here. And MicroXperts has the machines to run it.

Looking for the fastest way to get on board with Windows95? Look no further. Our newest New Breed multimedia powerhouse features Microsoft's Windows95 system riding on your choice of blazing Pentium™ chips.

They made it easier. We made it faster.

You've read the reviews. You know what Windows95 can do. Plug and Play. Open more than 50 windows at a time. Run more than 15 major apps. Direct access to the Microsoft Network. And much more. We've designed all our New Breed PCs to help you get the max out of Windows95.

MicroXperts...Old hands at building value.

MicroXperts is not a novice to the PC world. In fact, we've made top-performing systems since 1987. Mostly for people who appreciate real value. That's why we make it easy to "THINK FOR YOURSELF."

486PCI Multimedia	Pentium Power Package #2	Pentium Power Package #3	Pentium Power Package #4
66.....\$1519 80.....\$1539 100.....\$1569	60.....\$1769 75.....\$1869 90.....\$1939 100.....\$2039 120.....\$2539	60.....\$2109 75.....\$2219 90.....\$2288 100.....\$2389 120.....\$2839	60.....\$2629 75.....\$2739 90.....\$2819 100.....\$2889 120.....\$3389
•8MB RAM •540MB IDE Hard Drive •256KB Cache •1MB PCI Graphics Accelerator •14" SVGA .28 NI Monitor •MidTower Case •3.5 1.44MB Disk Drive •4x CD ROM •14 Hot CD ROM Titles •14.4 Fax/Modem w/Voice •16 Bit Stereo Sound Card, Speakers, Microphone and Joystick •MS DOS 6.22, Windows 3.11 (Ask about Windows95 upgrade price and availability.)	•8MB RAM •540MB IDE Hard Drive •256KB Cache •Diamond Stealth 64 PCI with 1MB •PCI Fast IDE Interface •15" SVGA .28 NI Monitor •MidTower Case •3.5 1.44MB Disk Drive •4x CD ROM •14 Hot CD ROM Titles •MS DOS 6.22, Windows 3.11 (Ask about Windows95 upgrade price and availability.)	•16MB RAM •850MB IDE Hard Drive •256KB Cache •Diamond Stealth 64 PCI with 2MB •PCI Fast IDE Interface •15" SVGA .28 NI Monitor •MidTower Case •3.5 1.44MB Disk Drive •4x CD ROM •14 Hot CD ROM Titles •MS DOS 6.22, Windows 3.11 (Ask about Windows95 upgrade price and availability.)	•32MB RAM •1.2GB IDE Hard Drive •256KB Cache •Diamond Stealth 64 PCI with 2MB •PCI Fast IDE Interface •15" SVGA .28 NI Monitor •MidTower Case •3.5 1.44MB Disk Drive •4x CD ROM •14 Hot CD ROM Titles •MS DOS 6.22, Windows 3.11 (Ask about Windows95 upgrade price and availability.)

All New Breed Systems Include:

Flash BIOS for easy upgrading, PCI & ISA slots on motherboard, 2 high-speed serial ports and 1 enhanced parallel port using 16550 UART & ECP/EP 101 key space-saving keyboard, 7 bay case, 230 watt power supply, MS-DOS 6.22, Windows 3.11 (call for Windows95 upgrade price and availability), Mouse.

Prices Could Be Lower! Call Today!

We work night and day to get our customers the absolute best pricing. So when you call, ask. If we've negotiated an even better deal than what you see here, we'll tell you.

Think For Yourself!

Where else can you get: **LOWEST PRICES GUARANTEED**; 30-Day money back guarantee; 5 year $\odot$ warranty on labor; 3 year warranty on parts; **UNLIMITED** toll-free tech support; Custom built systems in a week.

MicroXperts

THINK FOR YOURSELF

CALL TODAY: 1-800-498-8511
HOURS: (EDT) M-F 8-12 am, SAT 10-8, SUN 10-6



All prices subject to change without notice. RMA number required on all returns. RMAs shipped prepaid. Shipping not refundable. Prices are higher at retail locations. Not responsible for typographical errors. Government, educational and corporate PO's accepted. All registered and unregistered trademarks are the sole property of their respective companies. 8/95

©MicroXperts - 6230 Cochran Rd. - Solon, Ohio 44139

CIRCLE 302 ON READER SERVICE CARD

Motherboards - Hard Drives - Monitors

Motherboards

486 VLB, 256K Cache, 21E Green PC
 486DX2-66/80/100...\$219/229/259
 486 PCI, 256K Cache, 21E
 Deep Green, 8-30 + 2-75 pin,
 Built-In PCI EIDE w/ I/O
 486DX2-66/80/100...\$279/289/319

Pentiums

Pentium, 256K Cache Intel ZAPPA
 Chip Set, Built-In PCI EIDE w/Fast
 I/O
 P75/P90.....\$539/629
 P100/P120.....\$729/1199
 Pentium, 256K Cache, SIS ChipSet,
 Built-In EIDE PCI Controller w/ I/O
 and ADAPTEC PCI SCSI Controller
 P70/P90.....\$599/689
 P100/P120.....\$789/CALL

Hard Drives

Western Digital

850 MB.....\$229
 1.2 GB.....\$339

Maxtor

850 MB.....\$219
 1.2 GB.....\$319

Seagate

420 MB.....\$159
 540 MB.....\$179
 1 GB.....\$299

MAG Monitors

Digital, Energy Star, Green PC
 3 Year Warranty
 DX15Fe 15".....\$349
 DX17F 17".....\$639

Notebook for the New Breed

Everex

StepNote P75 .. \$2149

- Intel 486DX2-66Mhz
- 8MB RAM
- 340MB Hard Drive
- Dual scan display
- Built-In 16 bit Sound Card, Speakers, Microphone and Digital Sound Clip
- Two Type II and one Type III PCMCIA Slots
- Docking Station Support
- 3-4 Hour Battery Time
- 3 year on-site warranty

Options

486DX4-75

524 MB.....\$2449
 810 MB.....\$2649

Fast. Powerful. Light.



486DX4-100

524 MB.....\$2549
 810 MB.....\$2779



SoftBoard

Life Just Got Easier!

Electronic Whiteboard

Imagine the project where you all have the same vision, the same objectives, and the same notes.



Mobile SoftBoard model 203



SoftBoard model 201 using SBRemote conferencing software

SoftBoard only *looks and feels* like an ordinary whiteboard. Whatever you create on a SoftBoard appears instantly on your Windows™-based PC. Once it's there, you can save it, print it, cut and paste it, e-mail it, fax it, even network it to multiple sites. Use SoftBoard in collaborative discussions and brain-storming sessions. You can share information, create new ideas and keep records without tedious transcribing.

From personal to conference room sizes, wall or cubicle mount, table top, or mobile, there's a SoftBoard to fit your needs: model 201, a full-size wall mounted version; model 203, integrated with a rolling stand; and model 205, a personal size version for your office wall, table top, or cubicle.

For our brochure and information on all our SoftBoard models call 1-800-334-4922 today.

SoftBoard®

M I C R O F I E L D



Microfield Graphics, Inc.
9825 SW Sunshine Court
Beaverton, OR 97005
503-626-9393, Fax 503-641-9333



Tele
conference
The Business Communications Magazine
"MOST SIGNIFICANT ADVANCE IN
AUDIOGRAPHIC OR COMPUTER
CONFERENCEING"

The New Spectra[★] Star 240

Better Color Than Tektronix and \$700 Less



- ✓ New Brilliant Colors & Photo-Realistic Image Quality
- ✓ Plain Paper Prints & Transparencies in 30 Seconds
- ✓ PostScript[®] Level 2 Thermal Color Printer
- ✓ Pantone[®] Color Matching
- ✓ 25 MHz RISC Processor and 6 MB RAM
- ✓ Up to 600 x 300 dpi
- ✓ 52 Professional fonts
- ✓ Ethernet LAN Cartridge Available
- ✓ Brilliant Transparencies At The Lowest Cost Per Page
- ✓ \$2995 Suggested List Price

call for free sample output

(800) 223-0999

or fax (510) 524-9954

Spectra[★] Star
from General Parametrics



CIRCLE 301 ON READER SERVICE CARD



AnthroCarts!

AnthroCarts will knock your socks off! Imagine how great it'll be when you find the perfect furniture for your equipment — just the right size, tough as nails construction and dozens of accessories.

And you'll find our service so real and responsive, you'll get a kick out of ordering direct!

Call for a free catalog!



Lifetime Warranty.



Adjustable for all sizes



Lots of choices

800-325-3841

6:00 AM to 6:00 PM PST M-F

Internet: sales@anthro.com



10450 SW Manhasset Drive

Tualatin Oregon 97062

Phone: (503) 691-2556

Fax: (800) 325-0045

GSA contract no. GS-00F-5040A. Available for OEM applications. Prices from \$159.00
Anthro, AnthroCart and Technology Furniture are registered trademarks of Anthro.

CIRCLE 340 ON READER SERVICE CARD

\$95 for '95

SmarTerm® 32-Bit Edition for Windows® 95 Your Smart Choice for PC-to-Host Connectivity



As you migrate to Windows 95, make the Smart Choice for only \$95...but only in 1995. Use SmarTerm to maintain your PC connections to UNIX, IBM, and DEC hosts without interruption.

SmarTerm offers you the most precise VT and TN3270 emulation for Windows 95. Now you can move to Windows 95 without having to worry about losing your host connections.



SmarTerm is designed to automate common tasks, making your work easier. Whether you record a script, use the pop-up keyboard to learn keyboard mapping, send mail messages directly from SmarTerm, or transfer files with the drag-and-drop interface, SmarTerm saves your corporate help desk training time and support costs.

SmarTerm is a true Windows 95 application. It is easy to use and learn because it's Microsoft Office compatible, giving you a familiar look and consistent way to work with the other applications you use everyday.



**Make the Smart Choice for Windows 95 with SmarTerm.
Call your local software dealer today for \$95 for '95.**

Persoft, Inc., 465 Science Dr., P.O. Box 44953, Madison, Wisconsin 53744-4953 U.S.A.
Phone (608)273-6000, Fax (608)273-8227, Sales: 1-800-EMULATE or sales@persoft.com,
World Wide Web: www.persoft.com

Persoft Inc, European Headquarters, Lower Woodend Barns, Fawley, Henley-on-Thames, Oxfordshire, RG9 6JF, UK
Phone +44 (0)1491 638090, Fax +44 (0)1491 638010

SmarTerm 32-Bit Edition for Windows 95 pricing available through December 31, 1995. Regular suggested retail price is \$395. ©1995, Persoft, Inc. All Rights Reserved. Rev. 6/95.
Persoft and SmarTerm are registered trademarks of Persoft, Inc. Windows is a registered trademark of Microsoft Corporation. All other trademarks are property of their respective owners.

persoft

CONNECTIVITY SOLUTIONS
DOS • Windows • Ethernet • Token Ring
CIRCLE 350 ON READER SERVICE CARD



A New Carbon Copy 3.0. Access any PC

Carbon Copy 3.0 works with Windows® 95
and previous versions of Windows.

Available at Computer City, Egghead, CompUSA,
Elek-Tek, Fry's Electronics, Micro Center and more.

USA (617) 551-1000 · U.K. LTD. (44) 1 483-740763
FRANCE (33) 1 46 62 68 68 · SINGAPORE (65) 348-6628
AUSTRALIA (61) 2 413-3302 · GERMANY (49) 231 944-1500

© Microcom, Inc. 1995. All rights reserved

Microcom is a registered trademark and Carbon Copy
is a trademark of Microcom Systems, Inc.

All other trademarks are property of their respective holders.

If you haven't heard how fast and powerful the all-new Carbon Copy™ 3.0 is, allow us to bring you into the fold.

Carbon Copy 3.0 is packed with over 100 smart new features to make accessing a PC or LAN from anywhere a breeze. First on this rather impressive list is Carbon Copy's blazing remote control speed; with screen refresh rates up to five times faster than version 2.5. New File Synchronization transfers only the changes to an existing file, not the entire file, for speedy file transfers.

And should you ever lose your connection, our new Crash Recovery feature picks up the file transfer exactly where it left off. Non-Intrusive Installation doesn't replace drivers in your system.ini file for complete compatibility with peripherals.

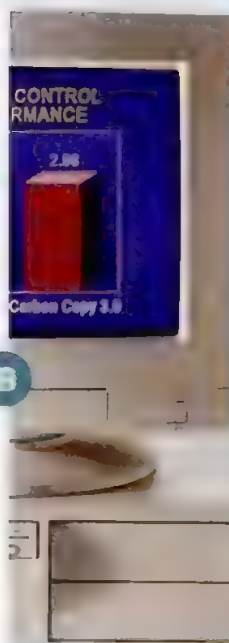
Our unique Modem Wizard feature automatically locates and configures your COM port and modem.

But that's just for starters.

Impenetrable security. Windows 95 compatibility. Automated scripting. Two-way remote drive access. Remote printing. The list goes on and on.

The all-new Carbon Copy 3.0 for

Windows is available at a limited introductory low price. To easily and quickly access more information call 1-800-822-8224.



microcom

CIRCLE 325 ON READER SERVICE CARD

in the time it takes to connect A to B. **B**



LOSE THE EXCESS AND YOU DEFINE POWER



POWER
STARTS AT JUST
\$219

THE PRICE SOUNDS LIKE A BARGAIN, BUT THE NAME CONFIRMS VALUE. THE ULTRA LINE FROM PRINCETON GRAPHIC SYSTEMS, RECOGNIZED FOR AWARD-WINNING DISPLAYS, HAS REDEFINED THE VALUE MARKET WITH ENVIRONMENTALLY SOUND, PERFORMANCE PACKED MONITORS THAT DELIVER EXCEPTIONAL POWER IN A NO-NONSENSE DESIGN.

FROM THE SUPER VGA ULTRA 14, TO THE DIGITALLY CONTROLLED, MULTI-FREQUENCY ULTRA 17, EACH MODEL COMBINES THE FEATURES AND FUNCTIONALITY THAT YOU NEED WITH OUR UNRELENTING DEDICATION TO PERFORMANCE AND QUALITY. THE COMPLETE LINE IS ALSO SHIPPED WITH A WORRY-FREE, THREE-YEAR LIMITED WARRANTY AND KNOWLEDGEABLE TECHNICAL SUPPORT TO KEEP THE POWER ON.

WHEN YOU GET RIGHT DOWN TO IT, A MONITOR SIMPLY PROJECTS YOUR THOUGHTS AND IDEAS. BUT WHEN YOUR THOUGHTS AND IDEAS ARE ON DISPLAY WITH EXCEPTIONAL CLARITY AT A PRICE THAT MAKES PERFECT SENSE, WELL, YOU START MAKING PRETTY POWERFUL STATEMENTS.

PRINCETON
GRAPHIC SYSTEMS

2801 SOUTH YALE STREET, SUITE 110, SANTA ANA, CA 92704 • TEL 1-714-751-8405 • FAX 1-714-291-5736 • 1-800-747-6249 TOLL-FREE

CIRCLE 067 ON READER SERVICE CARD

IT'S A LASER FAX, LASER PRINTER, LASER COPIER, SCANNER AND FAX MODEM.

IT'S ALSO AN AWARD WINNER.

Brother Multi-Function Center 4500 ML

SUITABILITY TO TASK	
Printing	Excellent
Faxing	Excellent
Copying	Excellent
Scanning	Excellent

-PC Magazine June 13, 1995

PC
MAGAZINE
EDITORS' CHOICE

June 13, 1995
Brother MFC-4500ML

*"When the dust settled
at PC Magazine Labs, though, the
only clear standout was the Brother
Multi-Function Center 4500 ML"*

-PC Magazine June 13, 1995

MFC The editors of PC Magazine wanted to find the best multi-function product on the market. First and foremost, it had to be laser—because no other technology produces flawless printer, fax or copier output. In addition, it needed to be a scanner, so virtually any printed graphic could be added to documents. It also had to be flexible enough to send and receive faxes directly from your PC.

Amazingly, this exact description fits the Brother MFC 4500 ML 5 in 1 Multi-Function Product perfectly. And because it retails for under \$1,000 it's no wonder the editors called

it "the only clear standout, the best value."
Thanks PC Magazine. We couldn't have said it better ourselves.



UNDER \$1,000

Available at these and other fine retailers:

COMPUSA OFFICE DEPOT OFFICEMAX
J&R MUSIC & COMPUTER WORLD NOBODY BEATS THE WIZ

We're at your side.
brother®

BROTHER INTERNATIONAL CORPORATION 200 Cottontail Lane, Somerset, NJ 08875-6714

CIRCLE 332 ON READER SERVICE CARD

FAST MOVE!

For Everyone Who Uses More Than One PC



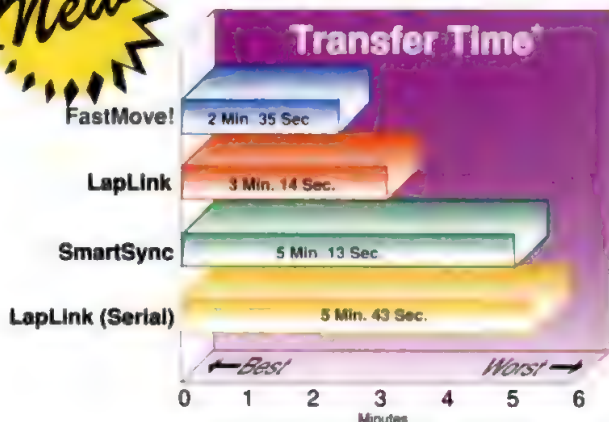
The Fast, Easy Way to Transfer Files

- Shows You Which Files Need to be Updated
- Scans Each File for Viruses
- Synchronizes PCs with Up-to-Date Files
- Simple Interface for Problem-Free Transfers
- Selects Just the Files You Want
- Includes Windows and DOS Versions

Plus: PC-to-PC Transfer Cable

✓ TouchStone

New



*Tests were performed by XXCAL, Inc., an independent testing lab, with files totaling 10 MB, using Windows 3.1 and a standard parallel port, unless otherwise indicated.

Everything You Need for Fast, Easy File Transfers

Whether you're transferring files between your old PC and a new one, synchronizing laptop and desktop PCs, or just copying some files from a co-worker, *FastMove!*'s speed, file synchronization, and virus scanning are an absolute must for everyone who uses more than one PC.

FastMove! is designed to make it easy to spot which files need to be updated. You select simple one-way copying or full two-way synchronization of directories with the most up-to-date files. Avoid mistakes and unnecessary transfers with *FastMove!*.

The Fast, Easy Way to Transfer Files

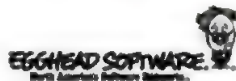
- Shows You Which Files Need to be Updated
- Scans Each File for Viruses
- Selects Just the Files You Want
- Synchronizes PCs with Up-to-Date Files
- Simple Interface for Problem-Free Transfers
- Includes Windows and DOS Versions

Includes: PC-to-PC Cable

For More Information Call:



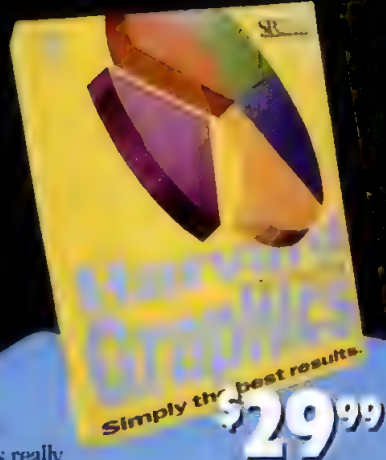
TouchStone®
Software Corporation
1-800-932-5566
(ext.710)



Harvard Graphics for only \$29.99!!

Have we Flipped?

We must have Flipped... if we're selling Harvard Graphics 2.0 for Windows at the unbelievable price of only \$29.99! You don't need a Harvard education to know what a great deal this really is! Talk about bang for your buck! The fact is, this is one of many tremendous deals that our buyers find in the marketplace everyday! Call for our catalog to take advantage of our rock bottom prices! Become a registered user eligible for upgrades and special promotions! Call now!!!



PC DOS 6.1
Get the best new features and functions plus a host of new enhancements that make PC DOS 6.1 a tremendous value!

\$19.99



1.573SharkWare 1.0 for Win
SharkWare provides you with the tools to build a network of contacts plus manage and plan your activities from Harvey Mackay

\$29.99



Reno by Media Vision
Portable CD-ROM Player
Reno is a double speed SCSI CD ROM drive with Lightning fast 180ms access time!

\$199.99



DeScribe 5.0 CD-ROM
for Windows, Windows NT, OS 2 and Windows 95
A powerful graphical word processor!

\$49.99



Peter Norton Microsoft Office Pro
Made Easy CD-ROM for Windows
Learn to use Microsoft Office Professional 4.3 Includes FREE Surplus Software Serial Mouse!

\$22.99



Peter Norton Windows 95
Made Easy CD-ROM for Windows 95
Learn the basics of Windows 95 Includes FREE Surplus Software Serial Mouse!

\$24.99



386MAX 7.01 and Sidekick 1.0
Bundle for Windows
386MAX Advanced integrated memory management tool
Sidekick A Powerful personal organizer

\$25.99



People Scheduler 1.0
for DOS and Windows
People Scheduler automatically schedules and tracks employees in an interactive graphical environment

\$32.99



Game Zapper
Zap VGA games, graphics, educational programs, interactive encyclopedias and more from your tiny PC monitor to your big screen TV!

\$39.99



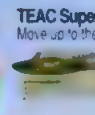
MediaForge 3.12 for DOS
Exercise your creativity to express your ideas, create interactive multimedia applications

\$119.99



Drafix CAD 2.1E for Windows
Easy to Use High Performance CAD Software
Powerful functions include lines, arcs, crosshatching, copy, mirror, rotate and more

\$29.99



TEAC SuperQuad 4X CD-ROM Drive CD-55A
Move up to the new standard in CD-ROM drive performance. Transfer rate of 600kpbs and a burst rate of 2.3 MB per second

\$194.99

WINDWARD CATALOG

80 Watt Speakers \$49.99
19.2 Alto Modem \$69.99
Pro Sonic 16 Sound Card W/7th Guest \$49.99
Toshiba QUAD Speed CD-ROM Drive \$199.99
TEAC QUAD Speed CD-ROM Drive \$194.99
Panasonic DBL Speed CD-ROM Drive
W Complons Encyclopedia \$124.99
12X12 Summasketch FX W Facial
Painter 2.0 \$379.99
Cyrix 386 to 486 upgrade for 386DX16 \$49.99

SOFTWARE CATALOG

Uninstaller 2.0 \$16.99
Disk Cloner \$14.99
Paradox 4.5 \$59.99
Internet Membership Kit for Windows \$14.99
DBASE 4.2 \$99.99
People Scheduler for DOS and Windows \$32.99
Idea Fisher 4.0 DOS \$19.99
Idea Fisher 5.0 WIN \$49.99
WinProbe \$19.99
PC Technician CD-ROM \$12.99

SOFTWARE CATALOG

All Clear 2.0 for Windows \$29.99
LapLink 2.0 \$16.99
Claris Works W Fax Works \$19.99
Maplinx1.5D \$29.99
Writers Toolkit \$18.99
MS Golf \$9.99
Quicken 2.0 SE \$4.99
Publishers Paradise \$5.99
Microsoft Entertainment Pack 2 \$5.99
Clear Org Charts \$19.99

SOFTWARE CATALOG

Sharkware 1.0 \$29.99
PC Technician CD-ROM \$12.99
Holy Bible 3rd Edition \$19.99
Check it Analyst For Windows \$29.99
Visual Slick Edit \$29.99
Easy Landlord \$46.99
Check it Setup Advisor \$12.99
Visual Slick Edit \$29.99
Calendar Creator 4.0 for DOS \$4.99
MS Windows for Workgroups \$29.99



- Compatibility Not Guaranteed
- Visa, MasterCard & Discover Card Accepted
- No chargebacks. Order is shipped. Shipping Charges Additional
- Purchases are Accepted upon Credit Approval
- Item Availability & Prices Subject To Change Without Notice
- Upgrade Offers & Special Promotions Are Subject To Change
- Returns Must Have Return Authorization Number
- Returns are Only Unopened or Defective
- No Returns on Used or Open Products
- All Defective Products Handled Through Manufacturer
- Orders Placed Before 1:00 PM Pacific Time Shipped Same Day
- Not Responsible for Typographic Errors

SURPLUS SOFTWARE
INCORPORATED

1-800-753-7877

CIRCLE 279 ON READER SERVICE CARD

SURPLUS SOFTWARE
MEANS VALUE PCMAU95

INTERNATIONAL ORDERS: (503) 386-1375
FAX ORDERS: (503) 386-4227
CUSTOMER SERVICE (503) 386-5215
499 NORTH 8TH ST. • HOOD RIVER • OR • 97031

◆ The Perfect System

for

The Perfect Office

A revolution in computing is quietly taking place. The home and office are no longer separate entities. People are not only working out of their homes more than ever, but creating their own small businesses there as well.



No one caters to the growing ranks of small and home office users better than CyberMax. We offer precision performance, unprecedented speed and power, and results that will impress time and again.

And perfection has never been so suite. CyberMax bundles systems with WordPerfect's PerfectOffice software, producing captivating documents and presentations to give you the professional edge. Add the security of an optional GE 4 year warranty, and we'll turn any office into the perfect office. Reap the benefits of perfection with CyberMax.

** Next day shipping on select systems*



Software Pack

PerfectOffice 3.0 includes:

- WordPerfect 6.1
- Presentations
- GroupWise
- Quattro Pro
- InfoCentral
- Envoy

CD Titles includes:

- Compton's Encyclopedia 95*
- AAA Trip Planner
- Mayo Clinic Family Pharmacist
- Weekend Home Projects
- MegaRace

*Tax Cut & Managing Your Money
Prodigy, America OnLine & CompuServe
WWF 3.11, MS-DOS 6.22*

*Warranty includes: 30 day Money Back
Guarantee, 1 Year Parts and Labor, 1 Year On-site
Service, and Lifetime Toll-free Technical Support.*

Family Max D-120

\$1599

- Am486DX4-120MHz CPU
- 8 MB RAM, 256K Cache
- 635 MB Enhanced IDE HDD
- 32-bit 2MB VESA Graphics Card
- 3.5" 1.44 High density floppy
- **Multimedia Pack**
 - Quad speed Toshiba CD-ROM
 - 16-bit stereo sound card & 1 pair spkrs
 - 5 popular CD Titles
- 14" Digital color .28mm NI 1024x768 monitor
- 14.4 kbps Fx/Mdm w/software
- Enhanced keyboard, High Res. mouse
- 6 bay vertical tower case w/ 2 fans
- **Software Pack**

AMD486/80MHz

\$1499

Executive Special

\$1949

- Am486DX4-100MHz CPU
- 16 MB RAM, 256K Cache
- 850 MB Enhanced IDE HDD
- ATI MACH 64-bit 2MB PCI Graphics Card
- 3.5" 1.44 High density floppy
- **Multimedia Pack**
 - Quad speed Toshiba CD-ROM
 - 16-bit stereo sound card & 1 pair spkrs
 - 5 popular CD Titles
- 15" Princeton Graphics Digital .28mm 1280x1024 NI Flat Screen monitor
- 14.4 kbps Fx/Mdm w/software
- Enhanced keyboard, High Res. mouse
- 6 bay vertical tower case w/ 2 fans
- **Software Pack**

Executive Max P-100

\$2499

- Intel Pentium® 100MHz CPU
- 16 MB RAM, 256K Cache
- 1.2 Gig Enhanced IDE HDD
- ATI MACH 64-bit 2MB PCI Graphics Card
- 3.5" 1.44 High density floppy
- **Multimedia Pack**
 - Quad speed Toshiba CD-ROM
 - 16-bit stereo sound card & 1 pair spkrs
 - 5 popular CD Titles
- 15" Princeton Graphics Digital .28mm 1280x1024 NI Flat Screen monitor
- 28.8 kbps Fx/Mdm w/software
- Enhanced keyboard, High Res. mouse
- 10 bay vertical tower case w/ 2 fans
- **Software Pack**

Pentium®/75

\$2299



CyberMax Inc.

1-800-437-4596 (610) 770-1808 133 N. 5th St., Allentown, PA 18102-4151

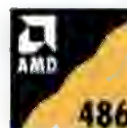
Cybermax accepts Visa, MasterCard, American Express and Prepaid checks. Purchase orders from government agencies, universities, and Fortune 500 companies can also be accepted. All returned items must have a RMA number and must be in original packaging. The cost of returned freight is not included with any back guarantee; shipping charges are not refundable. Prices and products descriptions are subject to change without notice. On-Site service may not be available in certain remote areas. Optional GE 4 year warranty.



FOUR YEAR



ON-SITE SERVICE



CIRCLE 341 ON READER SERVICE CARD



You don't work well with others.

How can you? After all, there's only so much information you can share on the phone. You can't exchange files. Or work together on the same application. You can't even see whom you're working with. Remove the barriers to collaboration. Because working together is what business is all about.



Here's how to see things eye to eye.

It's PictureTel Desktop Videoconferencing. When you get it, you can collaborate with anyone, anywhere—right on your PC—with the superior audio and video quality and standards compliance you'd expect from the industry leader. And at a price that works well with your budget. PictureTel Desktop Videoconferencing. How'd you ever get along without it?

Call 1 800 716-6000.



PictureTel



CIRCLE 295 ON READER SERVICE CARD

IF YOU'RE NOT USING MAPINFO TO SEE YOUR DATA, YOU COULD RUN INTO PROBLEMS, TOO.

Ouch.
Looking
at your data
without MapInfo®
desktop mapping software
is like flying blind. That's
because only MapInfo has the
power to combine your database and
spreadsheets with maps to
create colorful pictures,
rich with information.
Allowing you to look at your data with new
clarity. And see things you've never seen before.

MapInfo is the first PC software to truly leverage the
power of geography. Over 85% of data
has a geographic element. And

MapInfo uses it to com-
bine and visualize your
data in countless new
ways, letting you then per-
form sophisticated data
analysis. So once hidden
relationships, patterns and
trends jump out with eye-
popping sharpness. New

opportunities become crystal clear. And previously incompati-
ble data sets are combined to present fresh solutions to business
challenges. Bottom line: MapInfo
actually helps you make
smarter deci-
sions faster.
Which is why hun-
dreds of thousands of
people around the world are already
improving their insight with
MapInfo. To optimize sales
territories.



Target
media campaigns.

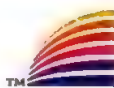
Carry out site analysis.
Track field service personnel.
Find the nearest store location. Locate
buried fiber optic cable. Dispatch ambulances.
Evaluate insurance risk. Assess storm damage. Route cargo.
Analyze crime patterns. Speed delivery. Plan land use.
And so much more.

Call us today at 1-800-327-8627 for our new, free demo.
It's a real eye-opener.



There are already over 300 off-the-shelf MapInfo
applications, covering virtually every industry.



 **MapInfo**
TURNING DATA INTO DECISIONS™

1800 327-8627

MAXIMUM SECURITY



Tangent's Just'NCase™ Server is Built to Last

Tangent Computer builds some of the best-designed and most reliable workgroup servers on the market. Six *PC Magazine* Editor's Choice awards for Tangent prove it. And every Just'NCase™ server comes pre-installed with Novell NetWare.* Each server is configured, certified and supported by Tangent's expert certified NetWare engineers, ensuring maximum reliability and security for years to come.



"All the trappings of a well-designed workgroup server."

PC Magazine, March 28, 1995

If your clients move to Microsoft Windows 95, Tangent servers will run great, just like they do now with Windows.™ Just'NCase servers are price-performers too—they won't break your budget. And they come with free post-purchase consultation.

Design Your Own Server Solution

Tangent Just'NCase Workgroup Servers can be customized to your specifications with rugged workhorse features like upgrades to Intel Pentium 100MHz, 120MHz and 130MHz processors, hot-plugable hard drives; hot-swappable power supplies; industrial-strength rack-mounted configurations and 100Mbit PCI-NICs. Full service and customer support programs, including Tangent's exclusive Platinum Install are available with all systems.

SMP SERVER 75

- Pentium™ 75 Processor
- 16MB RAM
- 2GB F-SCSI-2 HD
- 4X SCSI CD ROM Drive
- PCI-Ethernet Adapter

\$3,795

SMP SERVER 90

- Pentium™ 90 Processor
- 64MB RAM
- 4GB F-SCSI-2 HD
- 4X SCSI CD ROM Drive
- 4-Port PCI-Ethernet Adapter

\$6,595

With so many choices in SMP workgroup servers, only one brand stands solidly above the rest. Tangent. The ultimate in reliability. The maximum in security. Why settle for anything less?



tangent
Computer

1-800-800-5550
Call Tangent Today!

197 Airport Boulevard, Burlingame, California 94010
Fax: 415-342-9380 • World Wide Web: <http://www.tangent.com>
GSA Contract, Educational, VAR and OEM Inquiries Welcomed

© Copyright 1995 Tangent Computer, Inc. All rights reserved. Tangent, the Tangent logo and Just'NCase are trademarks of Tangent Computer, Inc. Registered in the U.S.A. Pentium is a trademark of Intel Corporation. Other trademarks are the property of their respective holders. Corporate pricing shown. GSA Educational VAR & OEM discounts available. Please call for a quotation. Pricing and configurations subject to change without notice. 2/3-95

CIRCLE 282 ON READER SERVICE CARD

Take control of your healthcare records with Personal Health Journal for Windows

~~\$69.00~~

FREE!

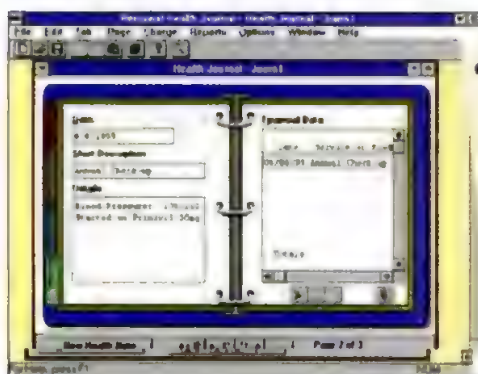
Free offer
limited to the first
250,000 orders!

Record health histories, track insurance payments,
produce reports and more! Order now and get
Personal Health Journal—a \$69 retail value—FREE!*



Here's the perfect way to keep vital medical and health information organized and ready when you need it: Personal Health Journal for Windows! It takes only minutes to set up and maintain a detailed medical record for anyone you choose. Insurance payments and reimbursements, immunizations, allergies... it's all there with the click of a mouse. Think of the time and aggravation you'll save! Call **1-800-243-6169** now to order!

Personal Health Journal is NOT shareware. It is NOT a limited demonstration program that requires you to pay more if you want the real version. No, Personal Health Journal is a complete, high-performance program that you'll be proud to add to your software collection!



Maintain detailed health histories for everyone in your household!

**"Your company stands out. The software you
produce is friendly and has qualities that
make it unique in a market full of options."**

J. Vincent, Houston, TX

**Free
Software!**

**Yes! Send me Personal
Health Journal for ~~\$69~~ FREE*!**

*Please add \$8.95 for shipping and handling (\$11.95 for Canadian orders and \$20.95 for all other orders outside North America). No purchase orders, please. Includes detailed User's Guide and expert technical support.

Name

Address

City State Zip

Daytime Phone ()

Evening Phone ()

Disk Size: ☐ 3.5" or ☐ 5.25"
(We will ship HD 3.5" disks if boxes are unmarked.)

Payment Method: ☐ Check or Money Order enclosed

☐ Visa ☐ MasterCard ☐ Discover ☐ American Express

Card #

Exp.

☐ Please just send me your FREE software catalog!



An **Intuit** Company

Product Development Center, One Parsons Drive, Hingham, MA 02043

Your priority code is 839295H

Hurry! Order your FREE copy today!

For a limited time, you can get Personal Health Journal for Windows absolutely FREE! Personal Health Journal has a retail value of \$69, but if you order now, we'll rush you your copy—not for \$49, not for \$29—but **absolutely FREE!** All you pay is \$8.95 shipping and handling.

Why is Personal Health Journal free?

It's simple. We want to make you one of Parsons Technology's more than 2 million loyal, satisfied customers. And giving you free software is one of the best ways we know.

You'll love Personal Health Journal, so we're sure you'll want to turn to many of our more than 50 other software titles for affordable, high-performance solutions in the future.

Order today and we'll rush you this great way to take control of your family's healthcare records—FREE!

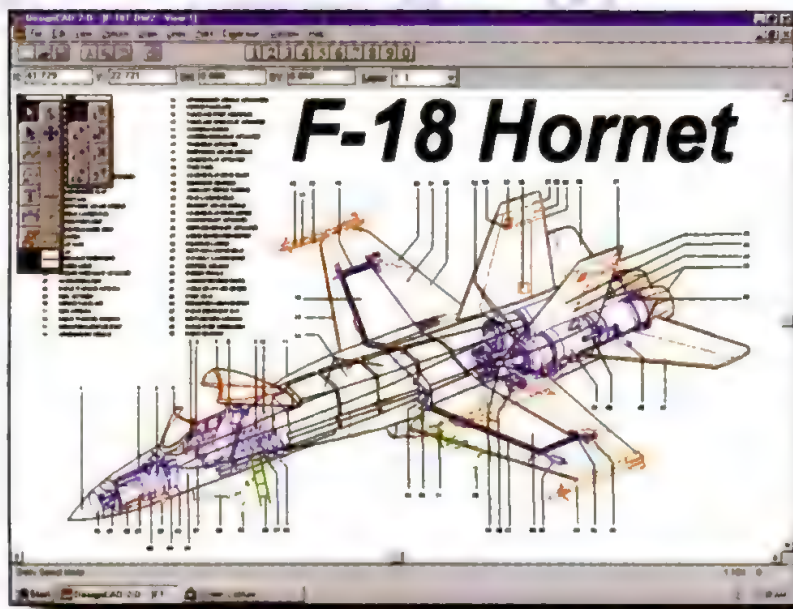
Call now to order:

1-800-243-6169

Operators are standing by 24 hours a day. Or fax the attached coupon to **1-319-395-7449** or mail it to us. You'll be glad you did!

System requirements: Personal Health Journal for Windows requires an IBM® or compatible PC, 2MB RAM, Microsoft® Windows 3.1 or later running in standard or enhanced mode, and 2MB hard drive space.

DesignCAD 2D



Anyone Can Do It!

Easy To Use

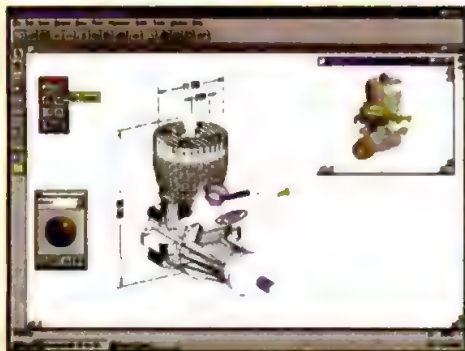
Powerful

Free Technical Support

Now there is a Windows CAD system that anyone can use: DesignCAD 2D! With DesignCAD you don't have to be a master engineer to create quality designs, yet DesignCAD is powerful enough for virtually any engineering, architectural, or other design application.

You don't need a special computer, either. DesignCAD runs under Windows 3.1 or Windows 95, and requires only 4 megabytes of RAM. DesignCAD supports all printers, plotters, and video cards supported by Windows, and it won't swallow up your hard drive -- it requires only 5 megabytes of hard drive space.

Also Available -- DesignCAD 3D



Professional 3D CAD

DesignCAD 2D is Flexible!

- Macro and Basic programming languages
- Customizable toolboxes
- File compatibility with DXF, IGES, HPGL, WPG, Metafile, and more
- Text with TrueType font support.

DesignCAD 2D is Easy!

- Quick edit boxes
- Simple, easy-to-use commands
- Extensive on-line help
- Excellent manual
- Free tutorial
- Free technical support
- Multiple views
- Automatic list of objects used in your drawing
- Automatic parallel and offset of lines

DesignCAD 2D Can Do The Job!

- Unsurpassed geometric construction
- Distance, area, and other calculations
- Advanced line trimming, even to circles and arcs
- Superior dimensioning options
- Macro capability and programming language
- Circular and rectangular arrays for making multiple copies of objects without redrawing them
- Advanced snap options for accurate snapping to objects, even their center of gravity

DesignCAD 2D is Priced Right!

With a suggested retail price of \$349, DesignCAD is available on the street at prices you can afford. With DesignCAD 2D, you can't go wrong!



To get your FREE demo disk, contact



American Small Business Computers, Inc.
One American Way, Pryor, OK 74361

(800) 233-3223 (918) 825-7555 fax (918) 825-6359

NEW!
Version 2 for
Windows™
Now Includes 3.5"
Disk and CD-ROM

90 DAY MONEY-BACK GUARANTEE
NEBS
GUARANTEES
YOU
30 DAYS FREE SUPPORT



Create professional brochures, newsletters, business cards, labels and more in minutes!

Now it's easy to print your own custom marketing materials for your business.

Page Magic™ is a Windows™-based, full featured desktop publishing package. Even if you have no design experience, you'll be quickly creating brochures, flyers, business cards, and even newsletters that call attention to your business. New user-friendly PagePilots™ walk you through each step of the design process. Or select a professionally-designed on-screen template, type in your message, and drop in easy-to-access Clip Art images for eye-catching graphics.

Get a FREE customer bonus when you buy Page Magic – over \$75 value!

When you register your Page Magic Version 2 software, you will receive a FREE Company Colors™ specialty paper sample kit, over 200 extra clip art images and additional PagePilots for flyers and newsletters.

Page Magic is the only program that lets you create a completely coordinated look to promote your business image.

Over 170 built-in templates that work with coordinated laser papers give you impressive output...effortlessly! The templates are designed to work perfectly with NEBS Company Colors™ specialty papers or plain paper. Create a single printed piece, or coordinate your business image on all your communications.

Look what you get with New Page Magic Version 2!

- PagePilots™
- Over 170 templates
- Process and spot color separation
- Clip Art browser
- Over 200 exclusive Clip Art images
- 30 days FREE technical support
- 90-day money-back guarantee
- And more!



The Small Business Resource™
NEBS, Inc.
500 Main Street, Groton, MA 01471

New Page Magic™
\$69.95
Suggested Retail Price
Call 1-800-388-4344
For more information or to place your order today.
Page Magic is available at
Computer Concepts City
Applied Technology Systems
1111 19th St., Groton, MA
Creative Software Inc. and others.

System Requirements: IBM PC or Compatible, 386 or higher Processor. 4MB RAM. Hard Disk Space 7MB minimum, 24MB max. Microsoft Windows™ 3.1. Any monitor supported by Windows (except CGA, EGA). Mouse or other pointing device supported by Windows. CD-ROM drive if using CD-ROM version. Any printer supported by Windows (inkjet or laser recommended.)
Windows™ is a trademark of Microsoft Corporation.

IQSPM14-98225

What's A Nice Brick Doing In a Place Like This?



...Probably 100MHz!



NoteBrick 100

\$3,295

Lease for \$131

- 100MHz 486DX4
- 12MB RAM
- 525MB HDD
- 11.3" DSTN Color
- 14-14 Fax/Modem

Full Fax Info Code 1285



CD-Brick 100

\$3,295

Lease for \$131

- 100MHz DX4 (Pentium Opt.)
- 12MB RAM
- 525MB HDD
- 10.4" DSTN Color
- CD-ROM

Full Fax Info Code 2185

CIRCLE 266 ON READER SERVICE CARD



PowerBrick 90

\$3,995

Lease for \$163

- 90MHz Pentium
- 16MB RAM
- 810MB HDD
- 10.4" DSTN Color
- 14-14 Fax/Modem

Full Fax Info Code 1485

The Ergo Difference

4 Year GE Warranty

All Ergo systems include the longest warranty in the business; 4 Years On-Site parts and labor*.

24Hr Tech Support

We have the best ratio of service techs to installed systems so you'll speak to a real person, not voice mail.

RescueMe™ Loaner

Our optional RescueMe program provides a loaner system or component delivered the next day if you call us by midnight.

60 Day Satisfaction Guarantee

Within the first 15 days you may receive a full refund if not satisfied. Within 60 days you may exchange your as-new Ergo for credit towards a different model.

Next Day Delivery

Your choice of a ThunderBrick or NoteBrick can be yours tomorrow. Call us by noon EST and we can often ship our most popular models the same day.



Triton Pentium Desktops Too!

Even if you stay at home you can enjoy the blazing speed and great graphics of a new desktop. Our Intel Triton motherboard based systems offer the highest performance starting from \$2,295. For full info use fax code 1785.

To Order or for Information
Call Mon-Sat, 9-7 EST

1-800-880-1925



For Complete Information & Latest Prices
Call our 24Hr. Automatic FAX

Product	Code	Product	Code
Pentium PowerBrick	1485	ThunderBrick Desktops	1785
Big ScreenNoteBrick	1285	SubBrick	1185
CD-Brick	2185	All Products Summary	1685

1-800-723-0778

Ergo Computing, Inc. One Intercontinental Way, Peabody, MA USA 01960 Tel: (508) 535-7510 Fax: (508) 535-7512
Ergo Computing UK, Ltd. Valley Rd, West Bridgford, Nottingham NG2 6HG Tel: 0115-9452565 Fax: 0115-9234854

How Do You Run More Applications In Windows?

RAM Doubler For Windows.

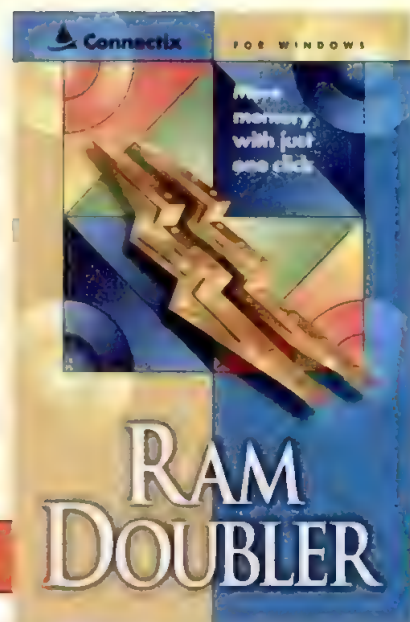
Introducing RAM Doubler™ for Windows®. It's software that makes your existing RAM work harder. Forget about buying more memory. Adding more memory to a Windows system doesn't let you run more applications simultaneously. That's because Windows doesn't use your RAM efficiently. With RAM Doubler on your PC you'll get rid of the "insufficient memory" message forever. And you don't have to open your machine. Just run RAM Doubler's 15 second installation and you can run more Windows applications – instantly. Buy RAM Doubler for Windows today, your satisfaction is guaranteed. RAM Doubler is available at CompUSA, Egghead, Computer City and wherever great software is sold (SRP \$99).



System Requirements: A PC equipped with a 386, 486, Pentium or equivalent processor • Windows 3.1 or 3.11, Windows for Workgroups 3.1 or 3.11, running in 386 enhanced mode • 4 MB RAM required, 8 MB RAM recommended • RAM Doubler for Windows works in tandem with any DOS memory extender such as QEMM or NoStem.

FREE
Upgrade for
Windows '95

More Memory With Just One Click



© 1995 Connectix Corporation, 2555 Campus Drive, San Mateo, CA 94403 USA • 800-899-0625 • 415-571-5700 • FAX 415-571-5700
E-Mail: info@connectix.com • RAM Doubler is a trademark of Connectix Corporation. All other trademarks are the property of their respective holders.

CIRCLE 009 ON READER SERVICE CARD

MOVING?

Please write to: PC Magazine, P.O. Box 54093, Boulder, CO 80322. Include your mailing label from a recent issue of PC Magazine for faster service. Please allow up to 60 days for change of address to take place.

and the amount in the Outstanding column should be the total of the Amount and the Sales Tax entries.

Note too that Current Total Outstanding in cell E1 should change to reflect both the additional outstanding amounts with each entry and the reduction in outstanding amounts when you enter a date in the Date Paid column. This gives you a convenient way to see how much a particular client owes.

Once you've entered data in one or more client sheets, take a look at the summary sheet. It will show you the current outstanding total for each client in column B and the current outstanding total for all clients in cell C1, which is labeled Current Total Outstanding. Before you can use this model to create actual invoices, however, you must set up the WinWord template files.

SETTING UP WINWORD TEMPLATES

Start by loading WinWord and opening BILLSVC.DOT. (Use BILLSVCT.DOT if you need to add sales tax; for the rest of this discussion, all references to BILLSVC.DOT will also apply to BILLSVCT.DOT unless explicitly stated otherwise.) Unless your directory structure and choice for placement of files exactly matches the system on which BILLSVC.DOT was created, you'll get a message box stating that BILLSVC.DOT is a mail-merge main document and that Word cannot find its data source. Choose the Find Data Source Button and WinWord will open the Open Data Source di-



Figure 4: The Find In Field dialog box lets you search for a record based on data in any field.

alog box. This looks and works just like the familiar File Open dialog box. Use the Drives and Directories boxes to navigate to the directory where you've stored OUTSTAND.XLW (or OUTSTANT.XLW), designate it as the file to use, and choose OK.

WinWord will then display a dialog box like that in Figure 1, asking you to specify which document (meaning which worksheet) to open. Select any of the

client sheets and choose Open. WinWord will respond with the dialog box shown in Figure 2 and will ask you to specify the Name or Cell Range to use. Choose To-Bill from the drop-down list and then choose OK. Note that you should not check the Format as Mail Merge check box. WinWord will load the file.

If you browse through the template file, you'll find it consists of two sections. Section 1 is an envelope; section 2 is the invoice itself. Each section includes the text "Put Your Name And Address Here," which you should replace with your own name and address. The section with the invoice also has the text "Put Phone Number Here," which you should replace with your phone number. You may also want to adjust the font, placement of text, and so on. But be careful not to erase either the mail-merge fields or the two place markers that say "Address Here" in red.

If you have WinWord set to show field codes, the mail-merge fields will show in curly brackets, with each field starting with the word MERGEFIELD. When working with mail-merge main documents, however, there are advantages to seeing field results rather than field codes. You can set WinWord to show field results by choosing Tools | Options, then View, and making sure the Field Codes check box is not checked. You'll then see either the merge field name in double chevrons (such as <<To_Who>> or <<Inv_No.>>) or the actual data for the currently selected record in the Excel worksheet.

To toggle between the field names and the data, click on the View Merged Data button third from the left in the Mail Merge toolbar, which WinWord automatically displays whenever you open a mail-merge main document. In general, you'll want to see the actual data when you're printing invoices. But when you're formatting or otherwise adjusting the template, you'll want to see the merge field name, since the field will disappear from view if no data for that field is in the currently selected record.

Once you've entered your name and address and you're satisfied with the for-

mat for the invoice, save BILLSVC.DOT and repeat the same steps with BILLEXP.DOT, which is meant for billing expenses. BILLEXP.DOT differs from BILLSVC.DOT only in that it provides a table for itemizing expenses. There's no need for a version with sales tax, since you wouldn't add sales tax to an expense bill.

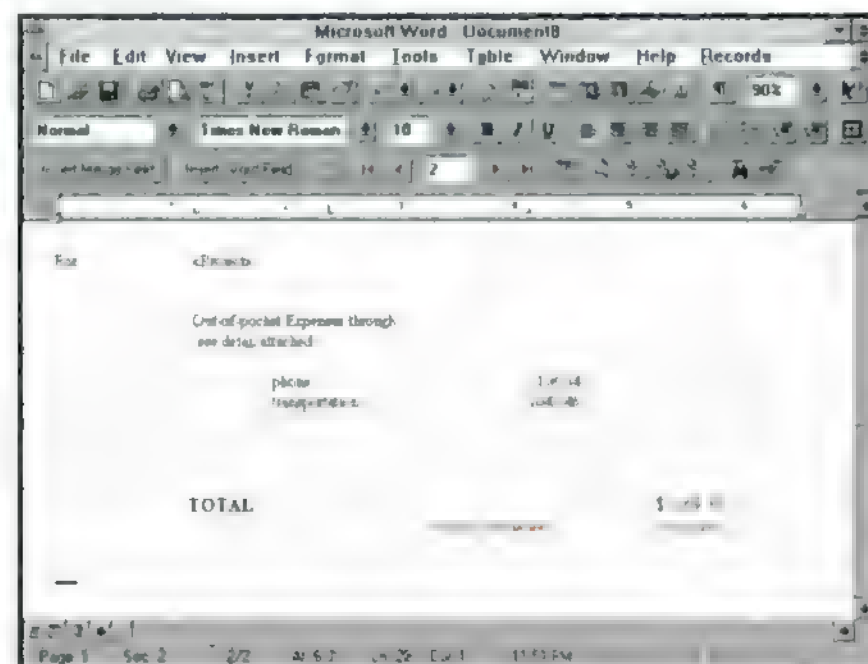


Figure 5: The BILLEXP.DOT template includes a table to let you itemize expenses.

When you've added your address to BILLEXP.DOT and adjusted the format to taste, you're ready to use the invoicing system.

CREATING INVOICES To create invoices for one or more clients, go to each appropriate worksheet in the workbook and enter the invoice date, the person or company you're billing, the project name (along with any description you want to add, up to Excel's cell maximum of 255 characters), the amount, and the date on which you expect to mail it (usually the same as the invoice date). For expense bills, enter the total for all expenses in the amount column and, if you're otherwise adding sales tax, clear the entry from the tax column for that row.

After you enter the information for all the invoices you plan to print in the current session, save and close the file. Then switch to or load WinWord. Choose File | New and—assuming you're billing for services rather than expenses—select BILLSVC as the template to use and choose OK. WinWord will start opening the file and will pause with the Open Workbook dialog box on screen to let you choose which worksheet to use. Select any worksheet that has data from which you need to create invoices and choose Open. Then choose ToBill as the Name or Cell

Range to use and hit OK.

You'll now be working with a document that's a copy of `BILLSVC.DOT`. As mentioned above, you can click on the View Merge Data button to see the actual data for each record as you move through the records and print invoices. You now have two choices for moving through the records.

Mouse users will find the necessary controls on the Mail Merge toolbar. Immediately to the right of the View Merge Data button are two buttons, a text box, and two more buttons. From left to right, they are: First Record, which takes you to the worksheet's first record; Previous Record, which takes you back one record; the Go To Record text box, which lets you specify a record to go to; Next Record, which moves one record down in the worksheet; and Last Record, which takes you to the last record in the ToBill range.

If you prefer using the keyboard, the template includes a custom menu with the same commands, plus one more. As shown in Figure 3, the menu bar has one extra menu, called Records, to the right of the Help menu. Alt-R opens the menu. The menu choices are: First Record (Alt-R,F), Last Record (Alt-R,L), Next Record (Alt-R,N), Previous Record (Alt-R,P), Go to Record (Alt-R,G), and Find Record (Alt-R,R). The first four match the toolbar buttons of the same names. Go to Record lets you edit the Go To Record text box without having to reach for the mouse. Find Record opens the dialog box shown in Figure 4, which lets you search for a specific entry in any database field.

PRINTING To print your invoices, go through the records to find the first one you want to print. The easiest way to spot the records you just entered is to look for today's date. Next, enter the appropriate address for the invoice on the envelope and for the invoice itself. The template lets you enter these addresses separately, because they are often different.

Not so incidentally, every time you enter a new address, you should select the text and store it as an autotext entry. That way you'll be able to insert it in future invoices simply by entering the abbreviation for the autotext entry and pressing F3. (If you're not familiar with Word's autotext feature, you can get the details by choosing Help | Search and searching

for Creating AutoText entries.)

After entering the address for the current invoice, print it using the File | Print command, optionally saving a copy of the file to disk. Then move on to the next record. When you've printed all the invoices on the current worksheet, close the file. If you have to print additional invoices from a different worksheet, open another new file, selecting the different worksheet when you open it.

The procedure for creating an expense invoice is similar except that `BILL-EXP.DOT` includes the table shown in Figure 5. To enter expenses, first fill in the appropriate date at the end of the line "Out-of-pocket Expenses through" just above the grid. Then list each item as shown in the figure, identifying the item in the third column from the left and the amount in the fourth column from the left. To compute the total, select the formula field in the last line of the chart and press F9 to update the field. Note the line in red below the table that reads "Total in Worksheet" and includes the <<amount>> field. Use this to check that the total calculated here matches the total in the worksheet, and be sure to delete this line before printing the invoice.

When you get paid, open `OUTSTAND.XLW` (or `OUTSTANT.XLW`) and enter the date of payment, both to give yourself a record of payment and to remove the amount from the total outstanding. If you get a partial payment, simply reenter the amount for the record as the original amount minus the partial payment, and make a note of the date and amount in the column to the right of the Date Paid column. This lets you keep track of the unpaid portion while still providing an accurate total of accounts receivable. When you get paid the remainder, reenter the correct total amount in the amount column and the date of final payment in the Date Paid column.

I've been using this invoicing system for over three years now (starting, of course, with earlier releases of Excel and WinWord) and have found that for my own small business, at least, it works better than any of the small-business invoicing systems I've seen for sale. □

M. DAVID STONE IS A CONTRIBUTING EDITOR OF *PC MAGAZINE*.

VB Power



ISBN: 1-56276-073-4
Price: \$34.95

This innovative guide by Dan Appleman turns Visual Basic programmers into power users by illuminating the tools of the Windows Application Program Interface (API). Includes a time-saving disk that contains source code from the examples in the text, plus a specially designed dynamic link library (DLL).



Available at fine bookstores, or call

1-800-688-0448
ext. 8448

© 1993 Ziff-Davis Press

\$50 REBATE!



Buy an OL400e LED page printer between June 1 and August 31, 1995, and get a \$50 rebate.*

The OL400e produces 300 dpi laser-class output at a fast 4 pages-per-minute, and its LED printhead carries a 5 year limited warranty.

And now this remarkable value includes an

equally remarkable rebate. Take advantage of them both. Act now.

For a dealer near you, call 1-800-OKI-TEAM, ext 602.

For a rebate form, call our faxback service at 1-800-654-6651. When prompted, enter document number 1020.



©1995 Okidata. Okidata Reg. T.M., M.D. Oki Electric Industry Co., Ltd.
* See your authorized Okidata reseller for full details. Offer good in U.S. only.

Power Programming

BY RAY DUNCAN

Publishing Databases on the World-Wide Web

The World-Wide Web has received a great deal of attention lately as a vehicle for electronic multimedia publishing. There's no doubt that the Web has empowered individual citizens unlike any technological development in recent history, and it has brought about an explosion of grass-roots creativity that is truly amazing. But when we look at the mainstream publishers and other media companies that are establishing a Web presence, we find that most are still using traditional books, journals, and newspapers as the fundamental models for their content—recycling existing material and adding a few hyperlinks, video clips, and sound bytes to make the content more flashy. A new and compelling paradigm for network-based electronic publishing, high-level tools to support it, display hardware to make it irresistible to consumers, and a transaction mechanism to make it all profitable have yet to emerge.

To illustrate what I mean by this, reflect on the last few hours that you spent surfing the Net and think about how your time was actually used. You were probably sitting straight up in a relatively uncomfortable chair, in a cold room with harsh lighting, staring at a video screen with a fraction of the resolution and color depth of a printed page. Much of the session was likely occupied with waiting for a distant host to respond or for large graphics images to be transferred. A significant amount of time was expended in backing

out of hyperlinks that didn't turn out to lead to anything interesting or waiting for hyperlinks to time-out with a "host not found" message. If your machine was running Microsoft Windows, it probably crashed at least once or twice, requiring a lengthy pause each time while you rebooted and reestablished your network connection. Most likely only a few minutes out of the several hours were spent actually reading for pleasure or acquiring useful information before fatigue or ennui set in.

Is there anything in the experience I have just described that would convince you to give up a book or a magazine in favor of your laptop and a wireless network connection the next time you are relaxing on the couch, in the jacuzzi, at the beach, or under a Bo tree? Would you find this a pleasant and efficient way to learn a new language, study for a physics test, ponder the poetry of Blake, or lose yourself in a classic Dickens novel? I don't think so! And we haven't even begun to talk about why any publisher would want to forsake paper publishing in favor of the Web in the first place, considering there is currently no obvious way to make any significant amount of money from it. So while we await the ar-

rival of electronic currency; weightless, high-contrast, 2,000-dpi, 24-bit color displays; and high-bandwidth wireless networking to the living room, jacuzzi, beach, and nearest Bo tree, let's imagine other ways the marvelous World-Wide Web infrastructure can be put to use. Let's consider, for example, remote access to databases.

Up until a year or so ago, on-line publishing of databases was an extremely painful, labor-intensive, trouble-prone process, and only a few companies, such as Dialog and Westlaw, with exotic or irreplaceable content, deep pockets, and fanatical dedication were able to make a go of it. The difficulties of data acquisition and preparation, the relatively low-bandwidth access methods (mostly modem dial-up) available to end users, and the need for custom-built user interfaces all made on-line access to databases a marginal experience for vendor and customer alike.

As for the average scientist, educator, or businessman, any attempt to publish a database on-line was likely to founder eventually on any of a wide variety of technical, logistical, and financial shoals—not the least of which was trying to create robust "front-end" software for all the popular platforms and then keep that software compatible with the various rapidly evolving operating systems.

The proliferation of the Internet, the advent of the World-Wide Web, and the development of Web servers and browsers that include HTML, Version 2.0 "forms" support have virtually eliminated the obstacles to the creation and support of on-line databases. With a Web server acting as a buffer between the database and the network, and Web browsers functioning as platform-independent "front ends," network-based database publishing is now something almost anyone can do, and do well. The old user-interface inconsistencies, platform compatibility is-

Obstacles to the creation of on-line databases have been virtually overcome, and now network-based database publishing is something almost anyone can do, and do well.



LEADING-EDGE CMOS-9 OFFERS 2 MILLION GATES AND 155MHz SPEED

NEC is introducing a new generation of gate arrays using a 0.35µm CMOS process developed for 64Mb DRAMs. The CMOS-9 family offers major advances in speed, integration and power consumption for high-performance applications such as computers, telecommunications and networking products.

CMOS-9 gate arrays offer higher in-

tegration. The family has 20 base arrays ranging from 190,000 to two million raw gates (1.2 million usable gates).

CMOS-9 also offers more speed. A 2-input NAND gate operates at 119 picoseconds*. That's fast enough to support clock speeds of up to 155MHz.

CMOS-9 consumes less power. Operating at 3.3V, the new gate arrays dissipate only 0.9µW/MHz/gate —

about 30% less than our 0.5µm family.

Our new gate array family supports a wide variety of I/O functions including PCI and 5V interfaces. For high-speed system design, macros include Digital Phase-Locked Loop and Clock Tree Synthesis to manage clock skew problems. Package options are PQFP, Tape BGA and PGA. Pin counts range from 160 to 696.

The CMOS-9 gate array family is supported by our OpenCAD® Design System. It combines both proprietary and popular third party CAE tools in a unified, seamless environment.

*F/O=2, L=0.5mm

SDH NETWORKS EXPAND IN SE ASIA

Economically, Southeast Asia is now the fastest growing region in the world. It needs new and high-capacity information networks to support major development projects and changing lifestyles. Network providers in the region are rapidly introducing digital networks based on the international standard Synchronous Digital Hierarchy (SDH).

In Korea, NEC delivered a 2.4Gbps Fiber Optic Transmission System (FOTS) for a cable network spanning 2,230km. The network now distributes programs to CATV stations in 69 cities across the country.

NEC has also started delivery of an SDH FOTS for Singapore. Major equipment includes 852 sets of STM-1 (155Mbps), 95 sets of STM-4 (622Mbps) and a network management system for 1,050 elements. The contract has options for an additional 501 sets, including 51 sets of STM-16 (2.4Gbps).

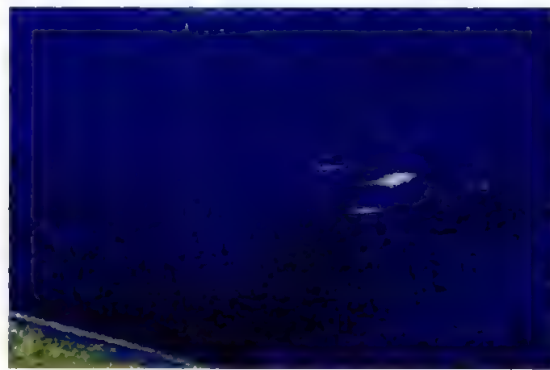
Network providers in the Philippines and Indonesia have also ordered SDH networks from NEC. For the Luzon project, we'll supply 155Mbps SDH microwave radio equipment for 93 hops and an SDH FOTS for 54 links. For the Surabaya project, NEC will build a 622Mbps, 4-fiber ring network covering 20 stations. NEC will also supply digital switches with a total of 440,000 lines for the two projects.

AIRBORNE SAR DISPLAYS REALTIME IMAGES

Synthetic Aperture Radar (SAR) is an all-weather microwave imaging sensor. Aboard a light plane, our SAR acquires 2D and 3D images with a resolution of 5m x 5m over a swath 5km wide.

The SAR system has a wide range of applications including topographic mapping, resource surveys, environmental surveillance and monitoring of the earth's crust movement and volcanic activities. To broaden the

benefits of imaging radar, NEC has developed a compact, on-board data processor. It performs realtime processing of SAR data to display live images on the screen. The complete airborne SAR system is expected to play a dramatic role in search and rescue operations, typically at sea. The system can "see" ships in trouble even through clouds or at night.



A SAR display shows a 13m FRP boat, a 7m FRP patrol boat and 3m rubber life rafts. Photo by courtesy of the Maritime Safety Agency, Japan.

6X CD-ROM READERS

The faster your CD-ROM reader runs, the better it performs.

High-speed data transfer gives you smoother motion video and faster response from databases. NEC is introducing two types of lightning-fast CD-ROM readers: the external MultiSpin® 6Xe and the internal 6Xi.



NEC's new MultiSpin 6X CD-ROM readers feature a data-transfer rate of 900KB/sec. This is six times the standard speed. The 6X family also features an access time of 145ms. The readers come with a buffer memory of 256KB, and a SCSI-2 interface for easy expansion.

The MultiSpin 6X plays CD-I, video and audio CDs. It offers compatibility with MPC Level 2 and Multisession Photo CD. The MultiSpin 6X family easily handles the most demanding multimedia applications available today. It also prepares you for what's coming tomorrow.

NEC

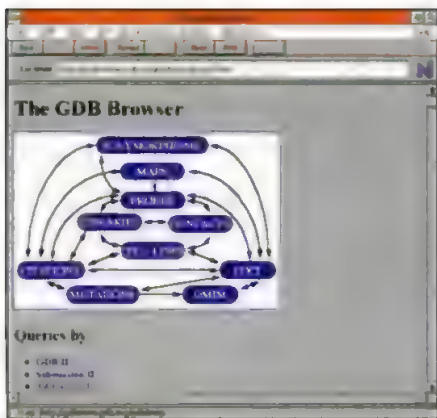


Figure 1: An example query against one of the most popular human genome databases on the Internet, the World-Wide Web version of Victor McKusick's On-Line Mendelian Inheritance in Man (OMIM). Here, we see the initial Web page for the server that hosts OMIM: It displays a graphical "map" indicating the various types of data available on the server and the relationships among them.

sues, and the chilling effect of per-user license fees or royalties for proprietary front-end software have all been mitigated or eliminated by the ready availability of Web servers and browsers for every popular CPU and operating system.

Even if you're only a casual Net surfer, you've probably used the World-Wide Web to access databases many times. Several of the popular Internet directory services—such as the excellent Yahoo (<http://www.yahoo.com>)—essentially function by querying a database of Web

Figure 2: After clicking on "OMIM" on the first page, we see a form that accepts search keywords and provides check boxes that can constrain the search. When the "Submit" button is clicked, a search is run against all the records in the OMIM database.

server URLs and content keywords. But for a truly stunning example of the power of database publishing on the World-Wide Web, we can turn to the Human Genome Project. This undertaking, which has been called the first Big Science project in the life sciences, has as its 15-year objective the complete determination of the human genetic code. The Human Genome Project has often been compared with World War II's Manhattan Project in its ambition and scope. Yet, unlike the Manhattan Project, which sequestered the country's best physicists and mathematicians in an isolated, pressure-cooker environment until they came up with the desired results, the Human Genome Project is almost completely decentralized. The funding agencies have parceled out tiny pieces of the project to scores of research teams scattered around the world.

In spite of this decentralization, which you might naturally suspect would be a barrier to effective collaboration and lead to fragmented, duplicated efforts, the Human Genome Project is ahead of schedule and under budget. How is this possible? The data each research team generates is electronically submitted over the Internet to one of many specialized databases, depending on its nature. There are relational databases for gene mapping, gene sequences, protein sequences, gene linkages, genetic probes, genetic diseases, individual chromosomes, and so on. The data is then linked to related data in the same and other databases, and it's made available almost immediately to the entire genome research community via Web servers that are universally accessible on the Internet.

Before we move on, let's look at a sample query to one of the most popular human genome databases on the Internet: the World-Wide Web version of Victor McKusick's On-Line Mendelian Inheritance in Man (OMIM). We first connect to the server at Johns Hopkins University that hosts OMIM and see a graphical "map" indicating the various types of data available on the server and the relationships between them (Figure 1). After clicking on "OMIM" in the map, we are shown a form (Figure 2) that accepts search keywords and provides check

boxes that can constrain the search. When the "Submit" button is clicked, the server runs a search against all the records in the OMIM database, and a weighted list of "hits" is returned (Figure 3). Finally, when we click on an item in the search-results list, the server delivers up the full text of the corresponding entry (Figure 4). The full text is in turn hyperlinked to literature citations, pictures and video clips, related entries in the same database, and other genetic databases.

DATABASE PUBLISHING STRATEGIES

In your own Net trekking, you will encounter three basic approaches to publishing databases on the World-Wide Web, although there are of course dozens of minor variations on each strategy. For the purposes of this discussion, I will assume that we are dealing with relatively complex relational databases; most of the more interesting databases published on the Internet fall into this category.

The first and simplest strategy is to flatten the contents of the database into hardwired joins or *views*, export the views into ASCII files, mark up the files with the appropriate HTML codes (either manually or programmatically), and place the resulting HTML documents on a Web server (Figure 5). With only a little additional effort, you can also build single or multilevel indexes or tables of contents by sorting the database on different key fields and then exporting the key fields and record numbers into ASCII files for HTML markup. This is analogous to the method I demonstrated for

Figure 3: The search returns a weighted list of "hits" for the database records containing the specified keywords and falling within any specified search constraints.

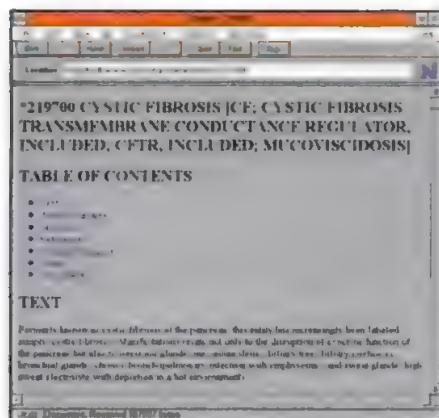


Figure 4: After we click on a member of the search hit list, the Web server delivers up the full text of the corresponding entry. The text is in turn hyperlinked to literature citations, pictures and video clips, related entries in the same database, and other genetic databases.

converting a database to a WinHelp file in the Power Programming column of March 14, 1995.

A strategy of intermediate complexity is to flatten the database into views, export it to ASCII files, and use Wide Area Information Server (WAIS) software to

index and search the data. The Web server, in effect, hands off control to a WAIS server to perform the search and deliver the results, and it only regains its connection with the remote user after the search is completed (Figure 6). In the early days of the World-Wide Web, this was a very popular method for providing search capabilities, mostly because the WAIS tools already existed and were relatively easy to leverage (WAIS evolved contemporaneously with Gopher text-based servers and predated the World-Wide Web).

There are several drawbacks to both of the techniques that I have just described. The most important problem is that the HTML or WAIS versions of the data are static between exports and do not necessarily reflect the current state of the underlying database. In addition, the data export and HTML markup process is relatively time-consuming and labor-intensive, even with the best automation methods, which deters people from performing an export every time the database changes. Lastly, the database flattening that occurs during the export process essentially strips out the relation-

al nature of the original database—any joins that are not hardwired into the export process are simply not available to the end user.

The third and most potent method of database publishing is to arrange for the end user to perform “live” queries against the database in real time using a gateway program. At present, this is typically accomplished with a Web server and a SQL database server running on a high-end Unix box. The Web server presents a form to the end user via the Web browser, collects the search parameters from the form, and passes the parameters to a SQL client via a standardized Common Gateway Interface (CGI). The SQL client program massages the parameters into a proper SQL query statement, sends the query to the SQL server, receives the results, formats the results into an HTML file, and passes the name of the resulting file back to the Web server. The Web server then transmits the HTML file containing the results of the query to the end user’s Web browser (Figure 7).

We’ll talk more about the CGI and

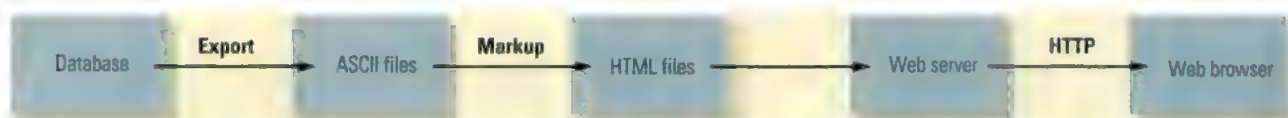


Figure 5: Schematic view of the simplest approach to database publishing on the World-Wide Web. Relational database views are exported to ASCII text files, marked up as HTML, and placed on a Web server for remote access. Single-level or multilevel indexes can be built by exporting subsets of the data.



Figure 6: A slightly more complex approach to database publishing on the Web than the one in Figure 5. Relational database views are exported to ASCII text files, indexed, and accessed with the aid of a Wide Area Information Server.

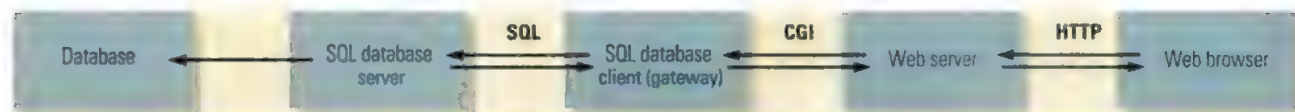


Figure 7: The most complex and most powerful approach to database publishing on the Web. Search parameters are collected from the user via HTML forms, then the parameters are passed to a gateway program, which formulates them into a SQL query and passes the query to a SQL server. The SQL server returns the search results to the gateway program, which formats the results into an HTML file and passes the name of the file to the Web server. The Web server then passes the HTML file containing the search results back to the Web browser for inspection by the user. This scheme allows Web browsers to serve as platform-independent front ends to live databases and provides the user with up-to-the-minute information.

gateway programs (of which there are many types) in a future column. In the meantime, I would like to show you an example of Web-based database publishing of the simpler type: a database exported to ASCII text files that are then subjected to programmatic HTML markup.

A PRACTICAL EXAMPLE The database I will use for this example is the same one that I used to illustrate the automated generation of Rich Text Format (RTF) code in the Power Programming column of March 14, 1995. The database contains the names, titles, departments, phone numbers, e-mail addresses, and locations of several thousand hospital employees.

The original or master copy of the database resides on the hospital's VAX cluster, where it can be accessed via a custom terminal-based query program. To migrate it from the VAX cluster to a PC where it could be manipulated more easily, the employee data was exported to a tab-delimited ASCII text file, then transferred over the hospital network to a PC. This file was then imported into a Microsoft Excel spreadsheet, where incorrect character mappings and other minor problems could be easily cleaned up, and finally it

was converted to a Microsoft Access database (Access can transform an Excel spreadsheet directly into a database table).

Once the employee information was safely tucked away in an Access database, almost anything became possible, including direct generation of HTML

code from the database contents. Access is an exceptionally powerful product, if somewhat of a resource hog, and the built-in Visual Basic programming language gives it almost infinite flexibility. Based on my experience with RTF generation, I knew that I needed two kinds of program modules. The first module, which I named Emit-

HTML (Figure 8), contains general-purpose subroutines to generate HTML file headers, trailers, and hotlinks (HTML anchors). The second module, called MainHTML (Figure 9), contains the database-specific code.

In order to generate the Web version of the employee database, the procedure Main() is run from a macro. Main() first calls WriteHTMLNameIndexFiles(), which sorts the database by last name and first name and then writes a two-level index or "table of contents" by name for

the employee database. The second level of the index by name consists of up to 26 files, one for each letter of the alphabet, with each file containing a list of employees whose last names start with that letter. The first level of the index consists of just the alphabet, with each letter of the alphabet hotlinked to a second-level index file. Main() then calls the routine WriteHTMLIndexFile() multiple times to sort the employee database by e-mail address, phone number, location, and department, and to write a one-level index for each. Since these latter indexes are used relatively infrequently, I didn't bother to implement them as two-level indexes like the index by name.

After Main() has written all the indexes, it calls WriteHTMLDetailFiles() to generate the detailed employee information records. Each employee's information is stored in a separate file whose filename is a function of a counter field in the record. Use of the counter field ensures that each employee has a unique ID number (and thus a unique filename), which makes it straightforward to link the abbreviated entries in the various index files to the individual files containing the employee details. WriteHTMLDetailFiles() calls a helper routine, WriteHTMLDetailItem(), to generate the HTML code for each line of a detail file. Since I couldn't assume the availability of HTML, Version 3.0, with its table support to create self-sizing vertical columns, the two routines conspire to align columns vertically by forcing use of a nonpropor-

```
Option Compare Database 'Use database order for string comparisons
Option Explicit

Sub EmitHTMLHeader (FileNum As Integer, FileName As String, TopicTitle As String)

' Generate HTML file header using the specified filename and
' file or "channel" number.

Open FileName For Output As #FileNum Len = 4096

' First emit HTML identifiers, text for window title bar,
' and heading for the client area
Print #FileNum, "<HTML>"
Print #FileNum, "<HEAD>"
Print #FileNum, "<TITLE>" & TopicTitle & "</TITLE>"
Print #FileNum, "</HEAD>"
Print #FileNum, "<BODY>"
Print #FileNum, "<H1>" & TopicTitle & "</H1>"

' Generate a horizontal rule to separate the client-area
' heading from the subsidiary information
Print #FileNum, "<HR>"

End Sub

Sub EmitHTMLHotLink (FileNum As Integer, HotLinkString As String, TargetString As String)

' Routine to generate a new line! The TargetString must be
' a valid absolute or relative URL. The HotLinkString is the
' text that is used in color or underlined by the user.

Print #FileNum, "<A HREF=" & TargetString & ">" & HotLinkString &
"</A>"

End Sub

Sub EmitHTMLTrailer (FileNum As Integer)

' Routine to generate the Web page footnote and the HTML file
' trailer and then close the file.

Print #FileNum, "<HR>"
Print #FileNum, "<ADDRESS>"
Print #FileNum, "Created " & Date$ & " / Last Modified " & Date$ &
"<BR>"
Print #FileNum, "Ahmanson Pediatric Center Cedars-Sinai Medical
Center"
Print #FileNum, "<A HREF=" & TargetString & ">" & HotLinkString &
"</A>"
Print #FileNum, "</BODY>"
Print #FileNum, "</HTML>"
Close #FileNum

End Sub
```

Figure 8: The EmitHTML module contains general-purpose routines for generating HTML file headers, trailers, and hotlinks.



“We want a color laser printer with integrated color and monochrome capabilities; automatic optimization of text, graphics, and halftones; electronic precollation; multi-platform connectivity ...”

We just want to do killer proposals.



Introducing the Xerox XPrint family of networked color laser printers. Now you can produce killer-color documents with integrated black-and-white pages easily and cost-effectively at the desktop color laser industry's lowest black-and-white cost per page. Exclusive Xerox *Intelligent Color* technology automatically applies the right printing methods for sharp text, smooth color graphics, and powerful photo images. The XPrint family has the quality workgroups demand, with the robust design and affordability network managers love. These new printers provide a full range of resolution, from 1200 x 300 to true 600 x 600 dpi, and offer page or document-set printing capabilities, all at 3 pages per minute in color and 12 pages per minute in black and white. Backed by the Xerox Total Satisfaction Guarantee. Call 1-800-54-XEROX for stunning print samples and the name of your nearest Xerox Document Network Reseller.

XPrint Family

4925 Color Laser

4920 Color Laser

4915 Color Laser



THE DOCUMENT COMPANY

XEROX



Adobe PostScript



Rem CSMC Employee Directory HTML File Generator
Rem Copyright (C) 1994-95 Ray Duncan

Option Compare Database ' use database order for string comparisons
Option Explicit ' force declaration of all variables

Function Main ()

' This is the main routine of the conversion program; it can be
' invoked with a command button or by running a macro. It generates
' several different sorted indexes of employee names, then generates
' an individual file for each employee containing the detailed
' information about that employee.

Call WriteHTMLNameIndexFiles("CSMC Directory by Employee Name",
'idxname', ".htm", "EntireName", "LastName", 1.5)
Call WriteHTMLIndexFile("CSMC Directory by VAX Account",
'idxvax.htm', "VaxMail", "VaxMail", 1.5)
Call WriteHTMLIndexFile("CSMC Directory by Extension", "idxext.htm",
'Extension', "Extension", 1.5)
Call WriteHTMLIndexFile("CSMC Directory by Location", "idxlocln.htm",
'Location', "Location", 1.5)
Call WriteHTMLIndexFile("CSMC Directory by Department",
'idxdept.htm', "Dept", "Department", 3)
Call WriteHTMLDetailFiles("EntireName")

End Function

Sub WriteHTMLDetailFiles (IndexField As String)

' This routine writes the HTML code for the employee detail
' information. An individual file is generated for each employee.
' The name of the file is a function of a counter field in the
' employee record. The caller specifies the sort order (which isn't
' really too important).

Dim Dbase As Database, Dsctl As Recordset, FileName As String
Dim TopicTitle As String

' open database and employee information table, set the sort order
Set Dbase = DBEngine.Workspaces(0).Databases(0)
Set Dsctl = Dbase.OpenRecordset("CSMC Directory", DB_OPEN_TABLE)
Dsctl.Index = IndexField

' now walk through the sorted recordset and write the detail records
While Dsctl.EOF <> True

' build topic title & employee detail filename;
' the filename is synthesized from a counter field
TopicTitle = (Mcase(Dsctl![LastName]) & ", " &
Mcase(Dsctl![FirstName]))
FileName = "emp" & LTrim\$(Str\$(Dsctl![ID])) & ".htm"
UpdateStatusBar ("Writing " & FileName)

' write the HTML header for the employee detail file,
' along with the full employee name as a header for the
' window's client area
Call EmitHTMLHeader(1, FileName, TopicTitle)

' force use of a nonproportional font so things
' can be lined up vertically
Print #1, "<PRE>"

' write the employee detailed information to the file
Call WriteHTMLDetailItem(1, "Credential", Dsctl![Credential])
Call WriteHTMLDetailItem(1, "Title #1", Dsctl![Title1])
Call WriteHTMLDetailItem(1, "Title #2", Dsctl![Title2])
Print #1,
Call WriteHTMLDetailItem(1, "Department", Dsctl![Department])
Call WriteHTMLDetailItem(1, "Division", Dsctl![Division])
Call WriteHTMLDetailItem(1, "Location", Dsctl![Location])
Call WriteHTMLDetailItem(1, "Mail Stop", Dsctl![MailStop])
Print #1,
Call WriteHTMLDetailItem(1, "Extension", Dsctl![Extension])
Call WriteHTMLDetailItem(1, "Dept. Ext.", Dsctl![DeptExt])
Call WriteHTMLDetailItem(1, "FAX", Dsctl![FAX])
Call WriteHTMLDetailItem(1, "Pager", Dsctl![Pager])
Call WriteHTMLDetailItem(1, "VAXMail", Dsctl![VaxMail])
Print #1,
Call WriteHTMLDetailItem(1, "Other Info", Dsctl![Other])

' turn off the nonproportional font
Print #1, "</PRE>"

' write footer information and HTML file terminators
Call EmitHTMLTrailer(1)

' go to the next record
Dsctl.MoveNext

Wend

' close the sorted employee recordset
Dsctl.Close

End Sub

Sub WriteHTMLDetailItem (FileNum As Integer, ItemName As String,
ItemData As Variant)

' This handy little routine writes a field title, tabs over (by
' use of nonproportional spaces), displays a detail item in boldface,
' and forces the end of line (no
 or <P> is needed since this
' routine is used within a <PRE> block).

Dim TabChars As Integer

' calculate number of spaces needed to simulate tab
TabChars = 28 - Len(ItemName)

' if the item name is too long, force at least one
' space to separate the item name from the item data
If TabChars < 1 Then Let TabChars = 1

' generate the HTML code for the item detail line, putting
' the item data in boldface if it is not null
If IsNull(ItemData) Then
Print #FileNum, ItemName & " "
Else
Print #FileNum, ItemName & " " & Space\$(TabChars) & "" &
ItemData & ""
End If

End Sub

Sub WriteHTMLIndexFile (TopicTitle As String, FileName As String,
IndexField As String,
InfoField As String, TabStop As Single)

' This routine writes an HTML employee index file, consisting
' of a list of hyperlinks, sorted on the specified database field.

Dim Dbase As Database, Dsctl As Recordset
Dim HotLinkString As String, TargetString As String
Dim TabChars As Integer
Const TabWidth = 18

' open database and employee data table, set the sort order
Set Dbase = DBEngine.Workspaces(0).Databases(0)
Set Dsctl = Dbase.OpenRecordset("CSMC Directory", DB_OPEN_TABLE)
Dsctl.Index = IndexField

' create the index file, write HTML header information
Call EmitHTMLHeader(1, FileName, TopicTitle)
UpdateStatusBar ("Writing " & FileName)

' turn on preformatted text attribute
Print #1, "<PRE>"

' now walk through the sorted recordset and write the index
' as a list of hyperlinks to the employee detail files
While Dsctl.EOF <> True

' synthesize the name of the employee detail file from
' the counter field in the employee record
TargetString = "emp" & LTrim\$(Str\$(Dsctl![ID])) & ".htm"

' skip records where the "InfoField" is empty or nonalphanumeric
If Dsctl[InfoField] >= " " Then

' format the indexed field and employee name for the index entry
HotLinkString = LTrim\$(RTrim\$(Dsctl[InfoField]))
TabChars = Int(TabWidth * TabStop) - Len(HotLinkString)
If TabChars < 1 Then Let TabChars = 1
HotLinkString = HotLinkString & Space\$(TabChars)
HotLinkString = HotLinkString & Mcase(Dsctl![LastName]) & ", " &
Mcase(Dsctl![FirstName])

' generate the hotlink and force end-of-line
Call EmitHTMLHotLink(1, HotLinkString, TargetString)
Print #1,

End If

' go to the next employee record

CONTINUED ON NEXT PAGE

Figure 9: The MainHTML module contains the database-specific code. The WriteHTMLIndexFile() and WriteHTMLNameindexFiles() procedures generate one-level and two-level indexes or tables of contents, sorted on the specified field. The WriteHTMLDetailFiles() routine generates an individual file for each record containing all the detailed information for that record; the filename is a function of a counter field in the record. The Main() procedure ties all the routines together and is run from the main Access window by a macro.

Think of it
as better
healthcare
for your data.

OPTI-UPS

Uninterruptible Power Systems

The health of today's computing is more critical than ever.
Don't protect your valuable investment with old technology.

In the past, you purchased a surge protector to protect your data and equipment. That's O.K. for a lightning storm, but your equipment is equally at risk from the common dangers of everyday power irregularities. Varied power levels in the form of slight power sags or power surges happen quite often and cause unhealthy stress to your valuable components.

Because today's systems require more sophisticated electronic line protection, you deserve the peace of mind an *Uninterruptible Power System* provides, and the OPTI-UPS 280E and 420E provide both.

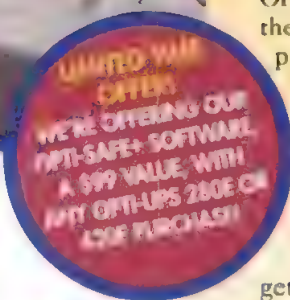
Designed for network and stand-alone use, both OPTI-UPS units exceed ANSI-IEEE 587 A & B lightning and surge suppression tests and provide complete protection from power blackouts, brownouts, surges, sags and other dangerous electrical disruptions. With built-in line conditioners, they also filter out power input line noise. Compact and easy to use, OPTI-UPS E-Series alerts you when the battery backup is low...and you can easily replace the battery yourself without even having to shut down.



Among the most sophisticated available, OPTI-UPS E-Series costs a lot less money than the competition. We're so confident of our protection we offer a \$25,000 guarantee against loss of correctly installed equipment. And for a limited time when you mail in your warranty registration and proof of purchase, we'll send you our OPTI-SAFE+ UPS Communication Software for FREE.

For your health as well as your system's, get the OPTI-UPS protection you need and the peace of mind you deserve. For more information just call 1-800-THE-OPTI.

OPTI-UPS



March 15, 1994
Optquest 1500D



April 1994
Optquest 4000DC



June 1994
Optquest 4000DC



September 1994
Optquest 4000DC



October 1994
Optquest 4000DC



October 1994
Optquest 2800DC


```

Dset1.MoveNext

Wend

' turn off preformatted text attribute
Print #1, "</PRE>"

' write the HTML file terminator and close the file
Call EmitHTMLTrailer(1)

' close the recordset
Dset1.Close

End Sub

Sub WriteHTMLNameIndexFiles (TopicTitle As String, FileName As String,
    Extension As String, IndexField As String,
    InfoField As String, TabStop As Single)

' This routine generates a first-level index file and a variable
' number of second-level index files for lookups by employee last
' name. The 2-level indexing allows much faster accesses over the
' network, especially for non-multithreaded first-generation Web
' browsers such as Mosaic 1.0.

Dim Dbase As Database, Dset1 As Recordset
Dim HotLinkString As String, TargetString As String
Dim CurFirstChar As String, CurFileName As String
Dim TabChars As Integer
Const TabWidth = 10

CurFirstChar = ""

' Create the master (1st level) name index file
CurFileName = FileName & Extension
Call EmitHTMLHeader(2, CurFileName, TopicTitle)

' write some explanatory information to the 1st level index
' file; this will be displayed above the hotlinks to the
' 2nd-level index files.
Print #2, "Click on a letter of the alphabet to view the "
Print #2, "employee last names beginning with that letter.<P>"

' open database and employee data table, set the sort order
Set Dbase = DBEngine.Workspaces(0).Databases(0)
Set Dset1 = Dbase.OpenRecordset("CSMC Directory", DB_OPEN_TABLE)
Dset1.Index = IndexField

' Now walk through the sorted recordset and write the 2nd level
' index files. There is a 2nd-level index for each letter of the
' alphabet for which there exists at least one employee last name
' starting with that letter. Each 2nd-level index file is a list
' of hyperlinks to the employee detail files.
While Dset1.EOF <> True

    ' synthesize the name of the file containing the employee detail
    ' information from a counter field in the employee record.
    TargetString = "emp" & LTrim$(Str$(Dset1!ID)) & ".htm"

    ' skip records where the "InfoField" is empty or nonalphanumeric
    If Dset1(InfoField) >= "0" Then

        ' is the first letter of this employee's last name the same as
        ' the previously processed last name? If
        ' UCase$(Left$(Dset1!LastName, 1)) <> CurFirstChar Then

            ' unless this is the very first time through this
            ' loop, close the previous 2nd-level index file.
            If CurFirstChar <> "" Then

                ' turn off preformatted text attribute
                Print #1, "</PRE>"
            
```

```

' write the HTML file terminator and close the file
Call EmitHTMLTrailer(1)

End If

' build the filename for this specific 2nd-level index
CurFirstChar = UCase$(Left$(Dset1!LastName, 1))
CurFileName = FileName & CurFirstChar & Extension

' add an entry to the 1st-level index file
' to point to this 2nd-level index file
Print #2, "| ";
Call EmitHTMLHotLink(2, CurFirstChar & " ", CurFileName)
Print #2,

' create the 2nd-level index file and write the
' various necessary HTML header information into it
Call EmitHTMLHeader(1, CurFileName, TopicTitle)
UpdateStatusBar ("Writing " & CurFileName)

' turn on preformatted text attribute to force use
' of a nonproportional font
Print #1, "<PRE>"

End If

' now format the employee name for the 2nd-level index file.
' if a phone extension is available, include that too.
If IsNull(Dset1!Extension) Then
    HotLinkString = Space$(TabWidth * TabStop)
    HotLinkString = HotLinkString & Mcase(Dset1!LastName) & ", " &
        Mcase(Dset1!FirstName)
Else
    HotLinkString = LTrim$(RTrim$(Dset1!Extension))
    TabChars = Int(TabWidth * TabStop) - Len(HotLinkString)
    If TabChars < 1 Then Let TabChars = 1
    HotLinkString = HotLinkString & Space$(TabChars)
    HotLinkString = HotLinkString & Mcase(Dset1!LastName) & ", " &
        Mcase(Dset1!FirstName)
End If

' generate the hotlink and write it to the 2nd-level index file
Call EmitHTMLHotLink(1, HotLinkString, TargetString)
Print #1,

End If

' go to the next employee record
Dset1.MoveNext

Wend

' close out the last 2nd-level index file by
' turning off the preformatted text attribute and
' writing the necessary HTML terminator info
Print #1, "</PRE>"
Call EmitHTMLTrailer(1)

' close out the 1st-level (master) index file
Print #2, "| <P>"
Call EmitHTMLTrailer(2)

' close the recordset
Dset1.Close

End Sub

```

tional font with the preformatted tag (<PRE>) and by emitting variable numbers of spaces in lieu of tabs.

You can find all of the program code mentioned here and a database containing a few sample records on ZiffNet in the file WEBDB.ZIP.

ADDITIONAL RESOURCES If you're interested in the computational challenges of the human genome project, you can find a brief introduction in "Hacking the Genome" by Deborah Erickson in the April 1992 issue of *Scientific American*. A more technical discussion of interest to

programmers can be found in "Challenges in the Human Genome Project," by Robert J. Robbins, in the March 1992 issue of *IEEE Engineering in Medicine and Biology*.

A nice introduction to World-Wide Web servers, WAIS, CGI, and gateway programs can be found in *Managing Internet Information Services* by Cricket Liu et al. (O'Reilly and Associates, 1994). Additional information about CGI can be found on-line at <http://info.cern.ch> and <http://hoohoo.ncsa.uiuc.edu/cgi/overview.html>.

For information about commercial versions of WAIS software and World-Wide Web gateways to WAIS, see <http://www.wais.com>. A public-domain version of WAIS is available on the Internet as well; you can obtain the source code by FTP from <ftp.cnidr.org> in the directory *pub/NIDR.tools/wais*.

THE IN BOX Please send your comments and suggestions to me at any of the following e-mail addresses:

CompuServe: 72241,52
MCI Mail: RDUNCAN
Internet: DUNCAN@CERF.NET □

Utilities

BY MICHAEL J. MEFFORD

WCompare: File Matchups Made Easy

You've installed a new Windows program that changes your SYSTEM.INI file, and suddenly Windows won't start anymore. What changes were made? The old version was saved under another name, but line-by-line comparisons are tedious. Or maybe you've made changes to a long AUTOEXEC.BAT file that didn't turn out to improve it. Is there a quick way to view the differences between the old version and the new? Programmers or people editing text documents also have a frequent need to compare different versions of the same file.

DOS provides two file-comparison utilities: COMP and FS. COMP is of limited value because it can compare only files of equal length. FS doesn't have this limitation, but the output is difficult to read. Some years ago I wrote a DOS utility called COMPARE (see *PC Magazine*, June 14, 1988), which improved upon COMP (FS was not available then) by letting users compare files of different lengths.

This issue's utility is an enhanced Windows version of COMPARE called WCompare. Like COMPARE, WCompare highlights the differences between two text files, irrespective of length. It improves upon COMPARE by letting you adjust comparison parameters from a menu instead of having to recompile the code, and its interface is much more user-friendly than that of FS. WCompare also adds full text-editing and printing capabilities.

You can download WCompare and its source code from the Internet or from the ZiffNet service of CompuServe, or you can obtain the files by mail. Refer to the sidebar "Guide to Our Utilities & How to Get Them" for details. The source code for WCompare, written in Borland's Delphi, is also provided for those interested in seeing how WCompare works.

USING WCOMPARE To install WCompare, simply copy its two program files, WCOMPARE.EXE and WCOMPARE.HLP, to a subdirectory on your hard disk and then use Program Manager to add an icon for WCompare to your desktop. Start WCompare by double-clicking on its icon. You will see two menu items, File and Help.

Select File | Open to open a text file

and four other menu items will appear: Edit, Character, Compare, and Window. WCompare is designed to work with text files only and is limited to a maximum file size of 32K.

Select File | Open again to open a second similar text file with which you want to compare the first. When you have two files open, select the Compare | Compare menu item to start the comparison process. The first difference found between the two files will be highlighted (see Figure 1). Note that you can open more than or less than two files, but only two files must be open to do a comparison.

WCompare compares the two files a character at a time, starting at the cursor positions in each file window. To compare two documents fully, make sure the cursor is at the start of each document (as it is when you first open the files). Any mismatch found during the comparison process will be highlighted, and the cursor is placed at the end of the highlighted difference. If you select Compare again, the comparison will start at the end of the last mismatch (see Figure 2).

WCompare will easily identify an added line such as that shown in Figure 3. If one of the files has a section that is significantly different from the other, such as a large insertion or deletion, you may find that WCompare can't figure out where the mismatch ends and where the files become the same again. One way of handling this is to adjust the comparison options (discussed below). Another way is simply to move the cursor past the large difference. This will synchronize the files so you can continue comparing.

COMPARE OPTIONS The options for WCompare are set through the Compare | Set Options dialog box (see Figure 4) and are saved in a file called WCOMPARE.INI in your Windows directory. The first two options, Synchronization Reach and Synchronization Sensitivity, let you adjust the comparison algorithm to suit your needs.

When WCompare finds a mismatch, it attempts to locate the point at which the files are synchronized again. The maximum number of characters for which WCompare looks ahead to find a match is called the Synchronization Reach; its default value is 400 characters. You can increase or decrease this value from the

Top 10 Utilities	
Rank	Utility
1	FDDLLS - Finds dead DLLs
2	FINDIR - IRQ line analysis
3	TAPECA - Windows calculator
4	WTIME - Keeps PC clock accurate
5	PLICON - Places program icons
6	SCHED - Runs programs automatically
7	MYGRPS - Customizes group icons
8	QUICKCO - Copies disks in one pass
9	WINCMD - Command file interpreter
10	ALLPAP - Customizes bitmap images
This list is based on the total number of downloads each utility has had on PC MagNet over the past month. To download these files, type GO ZNT:TIPS. For more information, see the sidebar "Guide to Our Utilities & How to Get Them."	

Compare | Set Options dialog box.

When WCompare looks ahead and finds a match, it then insists on a string of consecutive matching characters before it considers the two files back in sync. This is called the Synchronization Sensitivity, and it defaults to 10 consecutive matching characters (excluding spaces). Synchronization Sensitivity prevents false

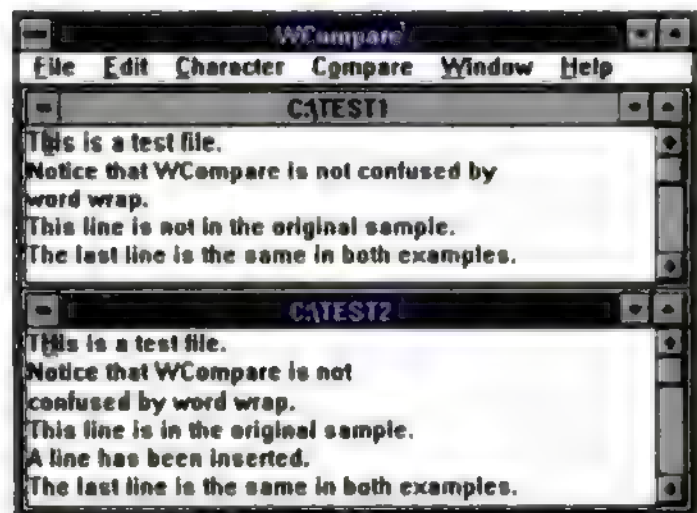


Figure 1: When you first compare these two test files, the lowercase *h* in *This* of the first file and the uppercase *H* in *This* in the second file will be highlighted as different.

matches of embedded words. For example, you wouldn't want to match *the* in one file to *thesis* in the other. You can increase or decrease the Synchronization Sensitivity from the Compare | Set Options dialog box.

By default WCompare tiles the file windows so you can easily see both files while comparing. You can change this to Cascade Automatically or turn it off altogether in the Compare | Set Options dialog box. To reverse the position of two tiled windows, click on the one you want in the top half and then choose Window | Tile. Or if you prefer cascaded windows, click on the one you want on top of the cascade stack and choose Window | Cascade.

Once you're satisfied with the selected options, click OK to use the changes just for the current session or click Save to save the changes to WCOMPARE.INI.

EDITING FEATURES In addition to its file-comparison capabilities, WCompare offers full text-editing features. This means you can edit differences you find while comparing and save your changes. You can also select File | New to create a new file, useful for taking notes after comparing files.

The Edit menu options let you cut, copy, paste, and delete text; there's also a

Select All option. Since WCompare highlights text differences just as if you had selected the text in the conventional way, the text is ready for cutting or copying. Clicking the right mouse button within a document brings up a pop-up menu with the Edit menu text-handling options.

The Character menu lets you change text justification (left, right, or center), turn word wrap on or off, and change the document's font. Full printing capability (Print and Print Setup) is available from the File menu. Of course, you can use any of these editing features and not compare a thing.

INSIDE WCOMPARE Longtime *PC Magazine* readers may recall my utilities first appearing here way back in 1986. Those utilities, like all the early DOS utilities, were written entirely in assembly language. Writing Windows programs in assembly language, however, is highly impractical. At first, all Windows utilities were written in the higher-level language C. Today there are many other options. One of the newest and most appealing is Delphi, a Pascal-based visual development system from Borland. I chose Delphi as the tool to write WCompare.

Like Visual Basic, Delphi uses prebuilt objects, called *components*, to make programming easier. But for WCompare, Delphi has an important advantage over Visual Basic: It allows the use of embedded assembly language code. WCompare's comparison procedure, a "scan until next matching sequence" algorithm, is implemented in assembly language to

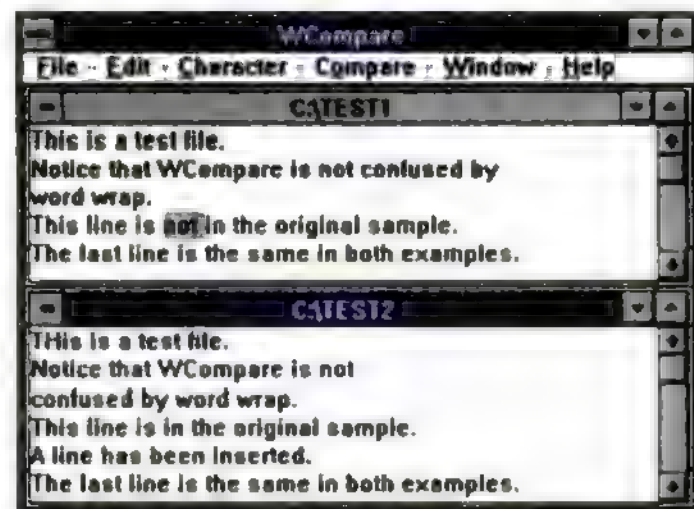


Figure 2: The second time you click Compare, the added word *not* will be found in the first file.

improve speed.

The Compare procedure is a great example of when a low-level language can enhance a high-level language like Pascal. The comparison algorithm must perform

many comparisons to find first a mismatch and then a match, each time marking the point where the mismatch ends. The comparison processing is much faster in assembly language than it would be in Pascal.

Because Delphi has a built-in in-line assembler, you don't have to assemble the code outside of Delphi and then link it in. All you have to do is surround the block of code with an ASM...END block pair instead of a Pascal BEGIN...END block pair. Not only that, you can access Pascal variables from your assembly code simply by using the variable names.

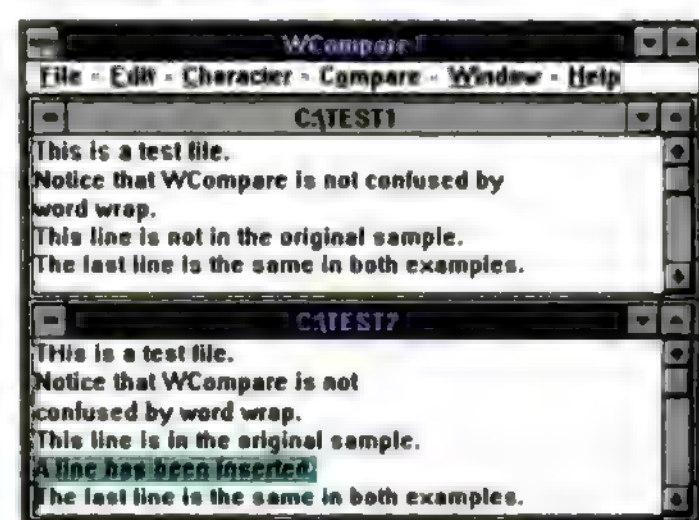


Figure 3: In the last comparison, WCompare will find the added sentence *A line has been inserted*.

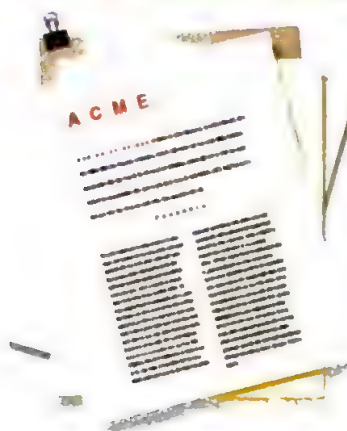
The algorithm for finding a mismatch is simple: It compares corresponding characters in each file until it finds something that's different, ignoring line breaks so as not to be confused by word wrap.

Once it finds a mismatch, the algorithm becomes a loop within a loop. The outer loop starts with the mismatch character in one file as the anchor position and looks for a matching character in the other file, the inner loop. How far forward it looks depends on the Synchronization Reach value.

If the algorithm finds a match, it then compares the next nine consecutive characters (for a Synchronization Sensitivity of 10) to see if they also match. If they don't, WCompare moves the anchor position up one character in the first file (the outer loop) and starts all over again, looking for a match in the second file. This continues until a match is found or the first file's anchor position moves the number of characters in the Synchronization Reach variable.

With the default Synchronization Reach of 400 characters, WCompare

A YEAR IN THE LIFE OF A FRAMEMAKER DOCUMENT.



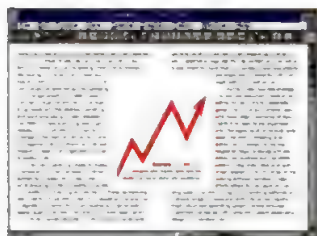
JAN 14

Acme Development Company's marketing department worked as a team to create its first marketing plan. Everyone contributed, each using FrameMaker's text, graphics, layout, formatting, and long document features. The end result was the best marketing plan in Acme history.



SEP 27

Ooops! Fido just made a meal out of some essential drawings. Fortunately, FrameMaker can import directly from the architect's workstation, since it supports popular CAD, graphic, and word processing file formats. It even runs on platforms like Macintosh, UNIX, and Windows.*



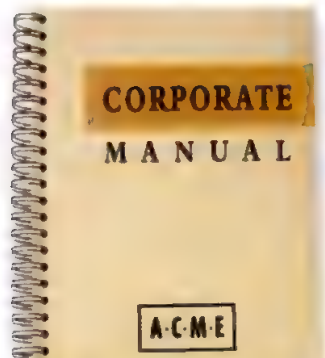
MAR 28

Business was booming, so Acme included its skyrocketing sales figures in the marketing plan. FrameMaker imported a variety of graphics, and flowed text neatly around them with the help of the new auto text wrap feature. It even has unsurpassed table editing for multipage tables.



DEC 3

Soon Acme had its very own Web site to help disseminate company information to employees and customers all over the world. So naturally, Acme made extensive use of FrameMaker's new HTML export capabilities. Now all its material could be published directly to the Internet.



MAY 10

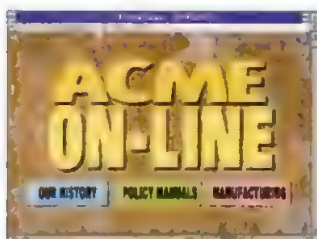
Acme hit the bigtime and went public, becoming Acme Corporation. To make sure all the IPO documentation was consistent, FrameMaker's import text and graphics by reference feature was used extensively for retrieval and update of boilerplate information created in FrameMaker or other applications.



INTRODUCING NEW FRAMEMAKER RELEASE 5.

Why is it that your most critical documents are in a constant state of flux? They get revised, reorganized, and redistributed, over and over again. It's as if they've taken on a life of their own. • They're what we call living documents, and they're what FrameMaker® does best. FrameMaker literally automates and manages the entire document publishing process — word processing, page layout, organization, and distribution. For publication on paper, on screen, or even onto the Internet, FrameMaker does it all. • Haven't you and your documents lived long enough without FrameMaker? Call 1-800-U4-FRAME Ext. 641 today for our free demo disk* and get a feel for how FrameMaker works. Then cruise by our web site at <http://www.frame.com>. And make FrameMaker an integral part of the life cycle of your documents.

FRAME



JUL 1

Suddenly Acme had a need to communicate online—to save time, paper, and even a few trees. So they used FrameViewer™ for instant online distribution with no additional post-processing or conversion required. It even supports FrameMaker's automatically generated hypertext links.

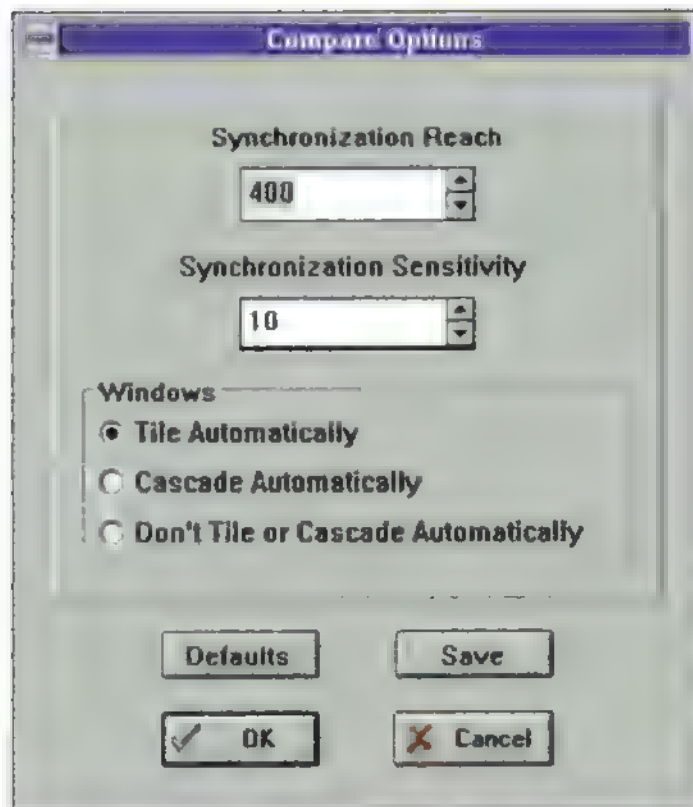


Figure 4: After customizing WCompare's options, click on Save to write the options to WCOMPARE.INI in your Windows directory.

might have to do as many as 400×400 comparisons. That's a lot of comparisons, even for our fast new computer systems. Assembly can be specifically coded to handle loop-intensive comparison situations like this and thus produce fast and efficient code without the high-level language overhead. The result is the desired quick response when comparing. The code-intensive interface portion of WCompare can be left up to Delphi's visual components.

MELDING PASCAL AND ASSEMBLY The complete Compare procedure is too long to publish here, so instead I'll concentrate

on a few interesting code segments and explain how the assembly language code ties in with the Pascal code. Figure 5 shows the beginning of the Compare event handler, which uses in-line assembly language to perform the actual comparison. Only the initialization portion of the assembly language code, which starts with the `asm` keyword, is shown here.

In Figure 5 you'll see the Compare procedure's `var` (variable declaration) statement followed by the local variables. Because the variables are local, only this procedure can see and use the variables, and they are lost when the procedure ends. Local variables are allocated on the stack. Farther down you'll find the code that initializes these local variables. For example, you'll see the statements

```
LocalSyncReach:= SyncReach;
LocalMatchReach:= MatchReach;
```

`SyncReach` is a public data field of the main form and is initialized when you first start WCompare. The `LocalSyncReach` variable is assigned a copy of `SyncReach` in the statement above. In assembly language this assignment would look something like this:

```
mov ax,ds:[SyncReach]
mov ss:[bp - 10], ax
```

where `bp - 10` is the stack base register

plus the index to the `LocalSyncReach` variable. (The 10 is an arbitrary value, chosen for this example.)

Why do this when we have access to the original in the global data segment? This gives the assembly language routine access to the variable, which is necessary for the reasons explained below.

Some care must be taken when merging Pascal and assembly language routines. During normal execution of Pascal code, the DS (data segment) register points to the program's global variables. The SS (stack segment) register stores the segment in which the local variables are stored. The BP (base pointer) register points to the local variables, and the SP (stack pointer) register points to the top of the stack. If an assembly language routine changes any of these registers without restoring them, the Pascal program won't be able to find its variables when it resumes control.

Since WCompare's assembly language routine changes the data segment, the very first instruction pushes DS onto the stack so it can be restored as required at the end of the block. The data segment is then changed to point to the buffer holding a copy of the file text. That is done with the load data segment instruction

```
lds si,EditBuf1
```

`EditBuf1` is a pointer to a buffer that was previously allocated on the heap with

```
type
  TFrameForm = class(TForm)
  .
  .
  .
  public
    { Public declarations }
    SyncReach: word;
    MatchReach: word;
    WinOption: word;
  end;

procedure TEditForm.Compare(Sender: TObject);
var
  EditForm1, EditForm2: TEditForm;
  EditBuf1, EditBuf2: PChar;
  Eof1, Eof2: integer;
  Size1, Size2: integer;
  TextStart1, TextStart2: integer;
  TextLength1, TextLength2: integer;
  TheSyncReach, TheMatchReach: word;
begin
  if FrameForm.MDICHildCount <> 2 then
    messagedlg('Two open files required for comparing.', mtInformation,
      [mbok], 0)
  else
    begin
      EditForm1:= FrameForm.MDICHildren[0] As TEditForm;
      with EditForm1.Mem0 do
        begin
```

```
      TextStart1:= SelStart + SelLength;
      Eof1:= GetTextLen;
      Size1:= GetTextLen;
      GetMem(EditBuf1, Eof1 + 1);
      GetTextBuf(EditBuf1, Eof1);
    end;
    EditForm2:=FrameForm.MDICHildren[1] As TEditForm;
    with EditForm2.Mem0 do
      begin
        TextStart2:= SelStart + SelLength;
        Eof2:= GetTextLen;
        Size2:= GetTextLen;
        GetMem(EditBuf2, Eof2 + 1);
        GetTextBuf(EditBuf2, Eof2);
      end;

    LocalSyncReach:= FrameForm.SyncReach;
    LocalMatchReach:= FrameForm.MatchReach;

    asm
      push ds
      cld
      mov ax,TextStart1
      mov cx,TextStart2
      lds si,EditBuf1
      les di,EditBuf2
      add Eof1,si
      add si,ax
      add Eof2,di
      add di,cx
```

Figure 5: The Compare event handler melds Pascal code with in-line assembly language code.



WHAT'S DRIVING MAXTECH?

Driven by the Power of...

EXPERIENCE • MaxTech, along with its affiliate GVC Corporation, is the world's largest manufacturer of PC modems, networking products and computer peripherals. No wonder five of the top 10 PC manufacturers put their name on our products.

PERFORMANCE • MaxTech custom designs each product using the latest technology for maximum performance and reliability. That's why our products are consistently rated as having the best price/performance value.

PRICE • Each year, MaxTech produces over 5 million communication products in its five ISO-9002 certified plants. This buying clout and production efficiency enables us to deliver high quality products with "value-added" features at the lowest possible price.

Modems • All MaxTech and GVC modems are engineered for throughputs up to 50% faster than other brands. And, each modem is packed with extras, such as call-back security, voice features, free fax/data software and a complete on-line service package.

Network Products • From 16-bit ISA NIC's to 32-bit EISA and PCI NIC's, HUBs, pocket adapters, PC cards and transceivers, MaxTech offers a complete line of network products for effortless network management.

Introducing the Yesbook™ - We took the "No" out of Notebook • Yesbook computers features a modular design which enables you to change and upgrade any key component at any time. You can custom select the CPU, the display, disk drive and more.

Monitors • Our line of 9" to 21" GVC brand color monitors provide the quality and performance you need. They come loaded with convenience and power features, all at prices tailored for the tightest budgets.

Now You Know.....

Since 1978, MaxTech has been driven by a commitment to the performance you need, at a better price than you thought, and the experience to make it all stick.

For more information about MaxTech products, please call 1-800-9FOR-MAX.

EXPERIENCE
PERFORMANCE
PRICE

MAXTECH
CORPORATION

MAXTECH
YOUR GVC CONNECTION

800-9FOR-MAX




```
@evaluate:
    pop    cx
    pop    cx
@evaluate_eof:

    sub    bx,TextStart1
    mov    TextLength1,bx
    mov    ax,word ptr EditBuf1
    sub    TextStart1,ax

    sub    dx,TextStart2
    mov    TextLength2,dx
    mov    ax,word ptr EditBuf2
    sub    TextStart2,ax
    pop    ds
end;

with EditForm1.Memo1 do
begin
    SelStart:= TextStart1;
    SelLength:= TextLength1
end;
with EditForm2.Memo1 do
begin
    SelStart:= TextStart2;
    SelLength:= TextLength2;
end;

FreeMem(EditBuf1, Size1 + 1);
FreeMem(EditBuf2, Size2 + 1);
end;
end;
```



Figure 6: The last part of the Compare assembly language routine stores the start and end of the different text in the variables TextStart and TextLength. These variables are passed to the TMemo component, which displays the selected text.

the statement GetMem(EditBuf1, Eof + 1). This assigns the EditBuf1 variable to a pointer to a memory block the size of which is Eof + 1, the length of the text plus one byte for the terminating zero. The GetTextBuf method of TMemo then copies the file text into the buffer. In the assembly language routine that follows, the load data segment instruction lets us find and compare the characters in the buffer.

Farther down in the assembly language code, we need to know how many characters ahead we should look for a match after a mismatch is found. This information is stored in the SyncReach variable, but the DS register now points to the place on the heap where EditBuf1 is stored. That isn't a problem, however, since we made a copy of SyncReach in the LocalSyncReach variable on the stack, where it is accessible. The instruction

```
mov cx, LocalSyncReach
```

stores the local variable LocalSyncReach

in the CX register. We're able to do this because we didn't change the BP register; it still points to the variable on the stack. This mov instruction is equivalent to

```
mov cx,ss:[bp - 10]
```

where 10 is an arbitrary number representing the index to LocalSyncReach. The beauty of Delphi in-line assembly language is that we don't have to know the index position of SyncReach on the stack. Delphi does the offset calculations for you from the variable name, another way Delphi makes programming easy.

The last portion of the Compare assembly language procedure places the location of the found mismatch and the length of the mismatch in the local variables TextStart and TextLength (see Figure 6). The last thing the assembly block has to do is pop DS to restore the data segment register so the Pascal code can find global variables. When this is done we can pass the values of these local variables to the TMemo component responsible for displaying the file and selected text.

The TMemo property SelStart contains the offset from the start of the file to the start of the selected text. The SelLength property is the length of the selection. The cursor position is SelStart + SelLength. If SelLength is zero, obviously nothing will be highlighted. The last task of the Compare procedure is to free the temporary text buffers that were allocated at the start of the procedure.

WCOMPARE'S EDITOR I want to mention one other part of WCompare: the editor component and how that is tied into the Compare procedure. The text editor used by WCompare comes from the TMemo component found on the Delphi Component Pal-

ette. TMemo handles scrolling, word wrapping, text justification, and all other features needed for text editing. All you have to do is feed it text and the object takes care of the rest.

In my original DOS Compare utility, I could easily show multiple mismatches, because I handled all the screen output. In WCompare, however, the TMemo component and Windows display and highlight the text. The TMemo component is based on the Windows multiline edit box, which can display only one selection at a time. (The multiline edit box has some other limitations as well. It can handle only 32K of text, and font changes apply to the entire text file.)

I could have written a custom control, but that would have been a huge amount of work. I decided to

accept that WCompare would be able to show only one mismatch at a time. This didn't seem too much of a compromise since the user can click Compare | Compare again to find and display the next mismatch.

By default, selected text is displayed in the active window only. To see this behavior in action, open, for example, two Word for Windows documents, tile them, and highlight text in each document. You'll see that only the active window displays its highlighted text. This standard Windows behavior wouldn't do in WCompare, which needs to show the mismatches in both files simultaneously. I was able

*The beauty of Delphi's
in-line assembly
language is that we
don't have to know the
index position of
SyncReach on the stack.*

```
procedure TEditForm.Print1Click(Sender: TObject);
var
    Line: integer;
    PrintText: System.Text;
begin
    if PrintDialog1.Execute then
    begin
        AssignPrn(PrintText);
        Rewrite(PrintText);
        Printer.Canvas.Font:= Memo1.Font;
        for Line:= 0 to Memo1.Lines.Count - 1 do
            Writeln(PrintText, Memo1.Lines[Line]);
        CloseFile(PrintText);
    end;
end;
```



Figure 7: Delphi's built-in printing component makes it easy to add printing functionality to Windows programs.



zap
alien



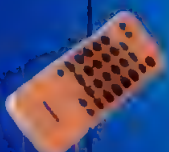
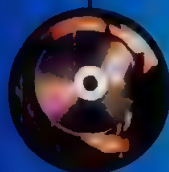
speak
the world



see a
horror
flick



write a
speech

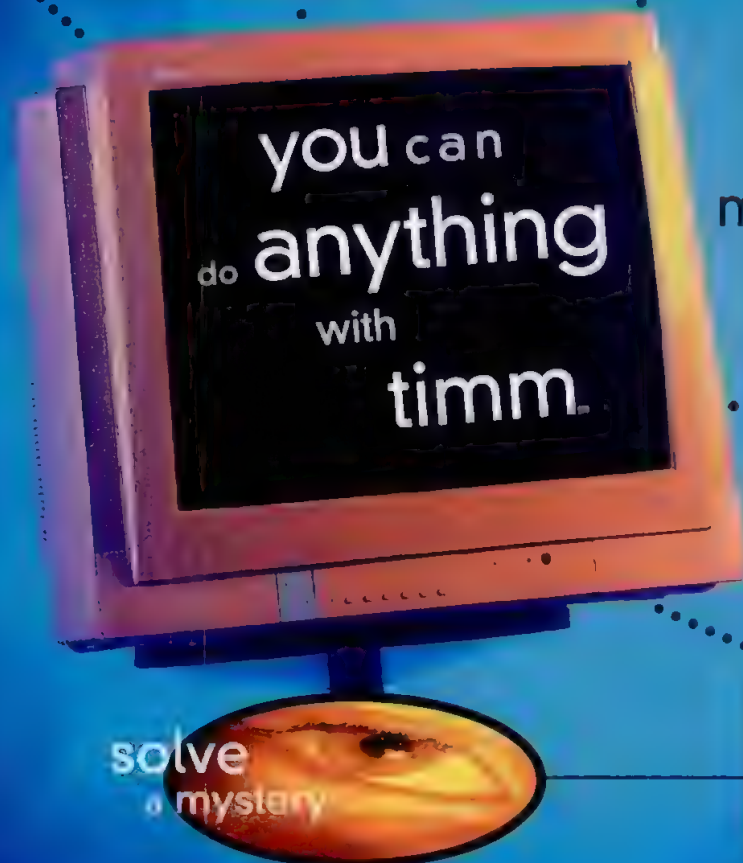


solve
a mystery

make a
presentation



get into
shape



meet **timmm**. the toshiba integrated multimedia monitor.

more versatile than any computer monitor

Timm is not just any computer monitor, because it's the world's finest 20" television, too. Which means you can hook Timm to almost any computer to play games, run CD-ROMs, or navigate the Internet, and then simply click the remote to watch TV or see videos—on the very same screen.

sharper than any television

There was no technology spared in creating Timm's astounding picture quality. The high-resolution, fine-pitch, FST Black™ screen and Invar Shadow Mask produce a dynamic picture with lifelike color purity and brilliant detail. On Timm, CD-ROMs have more clarity, games are more realistic, and television images are finer than ever before.

better sound than either

Complimenting Timm's unsurpassed visual attributes is an audio system of equal distinction. Timm eliminates the need for external speakers with an incredible 10-watt sound system that reproduces the full range of CD quality sound. And its Sub Bass System delivers rich bass tones, further enhancing the extraordinary multimedia experience available only with Timm.



See TIMM on Prodigy or on the Internet at www.hotwired.com/timm
TIMM is a trademark of Toshiba America Consumer Products, Inc. FST Black is a trademark of Toshiba Corporation.

In Touch with Tomorrow
TOSHIBA
Toshiba America Consumer Products, Inc.
4730 Wilshire Road, Wayne, NJ 07691

to accomplish simultaneous display in WCompare by changing the default value of the TMem property Hide-Selection from True to False before compiling.

Adding printing functionality in a Windows program is difficult when you are writing it from scratch using the Windows API. Delphi makes printing simple. The Print1Click event handler is called

when the user clicks on Print in the File menu. The handler launches the Print dialog box that was dropped on the form from the Component Palette. If the user clicks OK in the dialog box, the AssignPrn command opens the printer. WCompare then uses the Writeln statement to send the TMem lines to the printer (see Figure 7).

Delphi makes writing fast and full-

featured Windows programs easier than ever before. Its ability to combine in-line assembly language routines is unique among visual programming tools. The result in this case is a utility that is far more full-featured than its DOS predecessors. □

MICHAEL J. MEFFORD IS A CONTRIBUTING EDITOR OF PC MAGAZINE.

GUIDE TO OUR UTILITIES & HOW TO GET THEM

WCompare

PURPOSE: WCompare highlights the differences between two text files. It also provides full editing and printing capabilities. WCompare is designed to work only with text files of up to 32K each.

USAGE: To install WCompare, simply copy its two program files, WCOMPARE.EXE and WCOMPARE.HLP, to a sub-directory on your hard disk and then use Program Manager to add an icon for WCompare to your desktop. Start WCompare by clicking on its icon.

Select File | Open to open a text file, then repeat this procedure to open a second text file with which you want to compare the first. Make sure the cursor is at the top of each file. Select the Compare | Compare menu item to highlight the first difference between the files. When you click Compare | Compare again, the next difference between the files will be highlighted.

The options for WCompare are set through the Compare | Set Options dialog box. The options Synchronization Reach and Synchronization Sensitivity let you adjust the comparison algorithm to suit your needs.

FILES: WCOMP.EXE is just the executable program file. WCOMP.DOC is just the documentation file. WCOMP.ZIP is the source code, program, and documentation files.

SUPPORT: You can obtain help with PC Magazine's free utilities electronically in the Utilities section of ZiffNet's Utilities/Tips Forum (GO ZNT:TIPS). The authors of current utilities generally visit this forum daily. You may find an answer to your question simply by reading the messages posted in the forum. If the author is not available and the forum sysops can't answer your question, the Utilities column editor, who also checks this forum each day, will contact the author for you.

PC Magazine's utilities are available by modem from PC MagNet, our on-line service. PC MagNet is part of ZiffNet, a group of on-line services from Ziff-Davis Interactive. ZiffNet is hosted by CompuServe Information Service.

THE FIRST TIME If you've never used ZiffNet, you'll need to find the access number nearest you. Set your communications software to 7 data bits, even parity, no stop bits, and full duplex. Then dial 800-346-3247 with your modem. When the modem connects, press Enter. At the HOST NAME prompt, enter PHONES. Follow the menus and note the closest access number. Or dial 800-635-6225 (voice) for instructions.

HOW TO JOIN ZIFFNET Dial the local access number. At the HOST NAME prompt, enter CIS. At the USER ID prompt, type 177000/5000. When you see the PASSWORD prompt, enter PC*MAGNET. Finally, when you see the ENTER AGREEMENT NUMBER prompt, enter PCMC1S95. Current CompuServe members can type GO PCMAG at any CompuServe ! prompt. Once you enter your billing information, you'll see your personal user ID and temporary password.

MEMBERSHIP PRIVILEGES When you join ZiffNet you will be enrolled in both ZiffNet and CompuServe, for a charge of \$13.45 a month. Connect time charges are \$4.80 an hour, billed by the minute. Areas free of connect charges for ZiffNet members are PC Magazine Editors' Choice awards, the ZiffNet Magazine Index, Buyers' Resources, Newsbytes, ZiffNet Highlights, and the current Utility (type GO ZNT:FREEUTIL). For ZiffNet member services, call 617-252-5566.

FREE UTILITY The PC Magazine BBS at 617-231-4450 is no longer in service. If you are on the Internet, download the free utility from our anonymous FTP server at <ftp:pcmag.ziff.com>. Or request the utility by faxing to Public Brand Software at the number below.

NO MODEM, NO PROBLEM If you don't have a modem, you can get our utilities by mail. Just send your request with your name, address, and preferred disk size to Public Brand Software, 25 1st St., Cambridge, MA 02141, fax, 617-374-4007.

COPYRIGHT INFORMATION The programs presented in PC Magazine can be copied but are copyrighted. You may make copies for others if no charge is involved, but making copies or using any portion for any commercial purpose is strictly prohibited.

PC Solutions

TIPS AND TECHNIQUES TO INCREASE YOUR PRODUCTIVITY

■ HARDWARE

Long-Haul Printers

❓ In your column of February 21, 1995, you repeated the hoary claim that for "parallel [printer] connections, the recommended [cable] limit is 10 feet." I wonder if you've ever empirically tested this limit? I remember seeing an article somewhere in which the author stated that he had extensively tested longer lengths, and he reported no data loss at distances of more than 110 feet! (He had simply daisy-chained short cables together.) I have used 25-foot cables with no problem, and so have concluded that the 10- to 15-foot maximum usually cited is far too conservative.

John W. Price
via ZiffNet

► **PC MAGAZINE:** You're absolutely correct that it is possible to run parallel cables longer than 10 feet without problems. In fact, as far as I can determine, there is no formal specification that sets a length limit on parallel cables, though 10 feet (3 meters) has long been the *recommended* limit for the Centronics parallel interface. Hewlett-Packard still recommends this for its bidirectional parallel interface, and there are solid reasons for this.

The parallel port that we associate with PCs and printers is often called the Centronics interface, named for the company that helped make it popular. Like the ISA bus, this "standard" has never had a formal specification, but instead has evolved over the years. The new IEEE 1284 specification for an enhanced parallel port formalizes many aspects of this interface and expands upon it for high-speed, bidirectional communications.

Even this new IEEE specification does not limit the cable length, however. Instead, it defines the connection between

computer and printer in terms of complex electrical characteristics at the output end. This means you can have a short cable that's badly shielded and grounded improperly that cannot handle a parallel signal reliably. On the other hand, you can create a long cable with low capacitance and excellent signal isolation that can handle parallel signals over distances much greater than 10 feet.

As a rule of thumb, however, the 10-foot limit is a good starting point. If you purchase a cable of anything better than the absolute lowest-priced quality at this length, you stand a good chance of having a reliable connection. If you need to extend beyond this length, spend a bit extra to get a high-quality cable.—*Alfred Poor*

Notebook Upgrade

❓ I am a student at the United States Merchant Marine Academy, where I was issued a notebook computer. I've added more memory and an external monitor with speakers, and now I'd like to get a docking station for the computer and add sound support. Eventually, I want to add a CD-ROM drive as well. Do you have any suggestions?

James T. Flannery III
Kings Point, New York

► **PC MAGAZINE:** While a docking station is a possibility, you might want to consider adding a PCMCIA expansion product instead. Docking stations can add disk bays and expansion slots, but they tend to be short in supply and long in cost, because each one has to be designed more or less specifically for a single notebook model. Given the short lifespan of a notebook design these days, it hardly pays to manufacture too many docking stations.

Instead, your notebook's PCMCIA slot can provide much the same expansion functionality and ease of connecting and disconnecting that a docking station offers, but you'll have more available choices. Check with New Media Corp. (800-453-0550), Axonix Corp. (800-866-9797), and Zenith Data Systems (800-533-0331) about their PCMCIA multimedia upgrade products.—*Alfred Poor*

■ OPERATING ENVIRONMENTS

Fixing Your Windows Swap File

❓ I'm having two problems with Windows. The first is that I somehow caused Windows to tell me that a corrupt swap file exists. The second is that while I only

PC SOLUTIONS INDEX

Hardware

Long-Haul Printers421
Notebook Upgrade421

Operating Environments

Fixing Your Windows Swap File421
Checking Your Disk Space422

Word Processing

Prettier WinWord Tables432

Spreadsheets

Getting Down with VBA436
Printing Formulas in 1-2-3436

Databases

Creating a Progress Thermometer in Access

Basic436

Graphics

Typography 101444



PC DIRECT starts here with exciting offers from top direct vendors.

See index, page 432.

have 4MB of RAM, Quattro Pro for Windows used to work just fine. But now I get a message stating that insufficient memory exists to run the application. How can I fix these problems?

Charles J. Stephens
via ZiffNet

► **PC MAGAZINE:** As you might have guessed, the two problems are related. The Windows permanent swap file is required for the creation of virtual memory. If you have 4MB of RAM and a 4MB permanent swap file, it's almost as good as having 8MB of RAM. When all of the actual RAM is in use, Windows will swap idle programs and data to the permanent swap file to make more actual RAM available. Because your swap file is damaged, you've lost your virtual memory and no longer have enough to run Quattro Pro.

Here's what to do. First, you need to delete the old swap file. Launch Control Panel and start the 386 Enhanced applet. Press the Virtual Memory button and press the Change button in the dialog that appears. Set the swap-file type to None and press OK. Answer Yes to the confirmation dialog, but do *not* let Con-

Douglas Boling is a contributing editor and the author of many utilities, including MBOOT.COM and EMS40.SYS.

Frank J. Dertler, Jr., is senior networking editor and the author of the *PC Magazine Guide to Connectivity*.

Alfred Poor is a contributing editor and the author of *New Life for Old PCs*.

Jeff Presise is a contributing editor and the author of *DOS 6 Techniques & Utilities*.

Sal Ricciardi is a contributing editor and the author of the *Running FoxPro* books from Microsoft Press.

Our Advisors

Neil J. Rubenking is technical editor and author of *Can Do DOS*, *Can Do Windows*, and *PC Magazine Batch File Lab Notes*.

Joe Salemi is a contributing editor and author of the *PC Magazine Guide to Client/Server Databases*.

Luisa Simone is a contributing editor and the author of *Microsoft Publisher*.

Craig Stinson is a contributing editor and coauthor of *Running Windows 3.1* and *Running Microsoft Excel*.

M. David Stone is a contributing editor and coauthor of *Word for Windows Companion*, Second Edition.

trol Panel restart Windows. Press the Continue button instead and then exit Windows.

Switch to the root directory of the drive that used to hold the permanent swap file and issue the following DOS command

```
ATTRIB -r -s -h 386SPART.PAR
```

If this command does not return a "file not found" error message, delete the 386SPART.PAR file. Switch to the Windows directory and do the same for the filename SPART.PAR (use ATTRIB to remove its protection and delete the file

if it's present). These files should have been destroyed when you set the swap-file type to None, but it never hurts to be certain.

Now defragment your disk, using the DOS DEFRAG program or your favorite defragmenting utility. The permanent swap file needs a big chunk of contiguous disk space, and defragmenting is the way to get it. Finally, start Windows again, launch Control Panel, start the 386-Enhanced applet, click Virtual Memory, and change the swap file type to Permanent. Windows will recommend a swap-file size; you can accept it or choose a smaller size. Press OK, confirm that you want to make a change, and press the button that restarts Windows. You've got your virtual memory back! The corrupt swap-file message shouldn't come up any more, and Quattro Pro should have enough memory to run.

—Neil J. Rubenking

HOW TO CONTACT US

Do you have a hardware, software, or systems problem you can't solve? Do you have a tip you think other readers could use? Perhaps you'd like a better understanding of how something works. If so, we invite you to tell us about it. Our experts can give you practical solutions to your problems, provide techniques for using your software and hardware more productively, and help you grasp computer concepts and understand the latest technology.

It's easy to contact us. Just send us your submission (use ASCII format for text files) via the medium that's most convenient for you:

U.S. Mail: Solutions, *PC Magazine*, One Park Ave., New York, NY 10016-5802. (Please send a floppy disk along with a printout.)

Fax: 212-503-5799.

MCI Mail: Solutions, 556-3896

CompuServe: 72241,104.

Internet: 556.3896@mcimail.com.

PC MagNet: Select Submissions to *PC Magazine* from the main PC MagNet menu. Upload your file to the most appropriate library. If at any time you need help, simply type a question mark (?) and hit Enter; a list of commands will be displayed. If you are not already a member of PC MagNet but would like to join, follow the instructions on page 12 to find your local access number.

CompuServe Members: If you're a CompuServe member, you can join PC MagNet by typing GO PCMAG at any CIS prompt.

For any tip we print, you'll receive \$50 plus a *PC Magazine* T-shirt. We regret that we cannot answer letters individually.

Checking Your Disk Space

❓ Sometimes applications will not operate correctly or at all if there isn't enough disk space available. I'd like to be able to check whether a particular disk drive has sufficient space before beginning to use an application. Can you do this with a batch file?

Ted Benjeski
via ZiffNet

► **PC MAGAZINE:** The good news is that there's an easy way to check whether a specific amount of disk space is available. The bad news is that you have to express the number of bytes in hexadecimal

At USA FLEX, we give you a little more

FREEDOM.

Freedom to make your own decisions.

Freedom to tell us what *YOU* want. When

you need 16MB of RAM, you don't want

8MB. When you need lots of removable

storage capacity *and* CD ROM you want it in

the system, tested, no surprises. At USA FLEX

it's your right to expect expert

advice from knowledgeable

sales associates.

USA FLEX will custom configure

the system you want, test it and ship it!

That's Freedom. That's FLEXibility!



★ USA Flex is becoming good at offering exceptionally fast PCs at affordable prices...the Flex DX4/100 Desktop: It not only outperformed most of its DX4-100 peers, it also kept pace with the average Pentium-66...Support policies are excellent...With this system, you get Pentium-level performance and solid multimedia for a great price.

-PC WORLD May 1995

★ "The PT90 from USA Flex comes preconfigured with a full set of multimedia hardware, a powerful 90MHz Pentium processor, and an impressive stack of CD-ROM software. In sum the PT90 is a gung-ho multimedia machine that has it all. No wonder it roared into our Power Desktops Top 20."

-PC WORLD May 1995

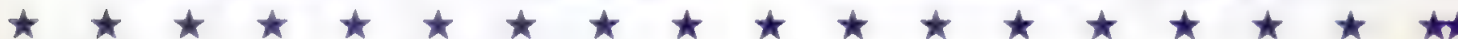
★ "Nothing's perfect, but some things come very close. One such thing is USA Flex's PT90 Quad Speed Multimedia Tower."

"The system bundles a cornucopia of extras and great performance in a package that could well redefine the concept of a full-bodied multimedia environment."

-COMPUTER SHOPPER May 1995

★ The \$1,995 USA Flex Family Edition offers a welcome combination of processing power and quality multimedia accessories, making it a good bet for the den or the home office.

-PC MAGAZINE December 1994



**Flex
Ultimate
PT 100
Multimedia
Tower**



Soar with the Freedom of Choice you deserve. When we know what you need to do with your system, we can suggest proven components that will handle all your projects with ease. Your job or your business may be riding on your choice of computer system. You can't afford to spend a lot of time and money on the wrong system. If you **KNOW** what you need, we won't try to talk you into some "combo-of-the-month" that has a lot of add-ons that you **DON'T** want. **USA FLEX** can take the guess work out of buying a PC by matching and testing the components you need. We've been doing it for over 18 years so we know what works, and we stand behind every system with 24 hour service and warranties that are the standard of the industry.

**Flex
Family
Classic**



USA★FLEX

1-800-333-4515

CIRCLE 210 ON READER SERVICE CARD



FLEX MULTIMEDIA CLASSIC

Intel Pentium 90 Processor • 8MB RAM • 850MB EIDE HD • 256K L2 W/B Cache • 1.44MB 3.5" Floppy Drive • PCI 64bit Video Accelerator w/2MB RAM, 16.7M colors @ 800x600 • PCI EIDE, 2 serial, parallel, game • 14.4/14.4 Data/Fax Modem • Internet Starter Kit • Trial subscriptions to America On-Line, Prodigy, CompuServe • Quad Speed CD-ROM Drive (Fast 600KB/s trans) • Wave Table 16bit Sound Card, SoundBlaster Compatible, Real Wave Table Sounds • Altec Lansing Stereo Speakers w/bass sub-woofer • Stereo Headphones, Joystick • 21 CD Titles (10 CD disks) • 15" MultiScan Color Monitor, .28dp, 1280x1024i (62KHz H-Scan) • DOS, Windows, Microsoft Mouse, Microsoft S/W Package • Desktop Case w/7 drive bays • Accessory Kit • 57 professional Monotype fonts • Hewlett-Packard DeskJet 540 Printer and Color Kit

\$2995

Includes Hewlett-Packard DeskJet 540 Printer and Color Kit



FLEX HOME/OFFICE SPECIAL

486DX4-100 Processor • 16MB RAM • 256K L2 W/B Cache • 850MB EIDE HD • 1.44MB 3.5" Floppy Drive • Video Accelerator w/1MB RAM, 16.7M colors @ 840x480 • 15" MultiScan Color Monitor, .28dp, 1280x1024i (62KHz H-Scan) • EIDE-I/O w/2 16550 serial, EPP/ECP parallel, game port • 14.4/14.4 Data/Fax Modem • Trial subscriptions to America On-Line, Prodigy, CompuServe • EIDE CD-ROM drive (Double Speed, 300KB/s trans) • Wave Table 16bit Sound Card, SoundBlaster Compatible, Real Wave Table Sounds • Amplified Stereo Speakers • Business Library on CD-ROM • DOS, Windows, Microsoft Mouse, Microsoft S/W Package • Desktop Case w/7 Drive Bays • 82 professional Monotype fonts • Epson ActionLaser 1100 Printer with printer cable • Internet Starter Kit • Accessory Kit

\$2495

Includes Epson ActionLaser 1100 Printer





Get Ready to Enter the World of Windows 95

Call and Reserve Your Copy Today!

MS Windows 95 Upgrade 470700	\$89	MS Office Standard 470717	\$242
MS Windows 95 470701	\$169	MS Office Pro Upgrade 470723	\$259*
MS Office Standard Upgrade 470716	\$174*	MS Office Pro 470724	\$509

*Prices include \$40 mail-in rebate from Microsoft.

SOFTWARE

Available on CD-ROM

CAD	
3D Home Architect V1.0 WIN	\$47
3D Home Architect V1.0 WIN on CD	\$59
Turbocad Designer V1.0 WIN by IMSI	\$34
Turbocad V2.0 WIN by IMSI	\$74

COMMUNICATIONS	
Compuserve Value Pack WIN	\$26
Laplink V6.0 WIN by Traveling	\$129
PC Anywhere V2.0 WIN by Symantec	\$119
Procomm Plus V2.11 WIN by Datastorm	\$123
Qmodem Pro V1.11 WIN by Mustang	\$58
Wildcat BBS V4.11 by Mustang	\$75
Winfax Pro V4.0 WIN by Delrina	\$76

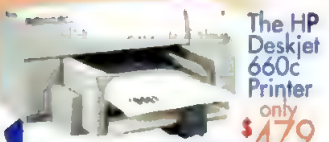
INTERNET COMMUNICATIONS	
Internet in a Box V2.0 WIN by Spy	\$89
Internet Membership Kit V2.0 WIN	\$39
Internet Starter Kit V2.0 WIN by Gnu	\$34
Internet Works by America Online by Gnu	\$33
Mosaic in a Box V1.0 WIN by Spy	\$18
Netscape Navigator V1.1 for WIN	\$34
Plug-and-Play Mosaic by Gnu	\$19

DATABASE	
Access V2.0 Upgd WIN by Microsoft	\$110
Access V2.0 WIN by Microsoft	\$290
Delphi V1.0 Upgd WIN by Borland	\$184
FoxPro V2.6 Pro WIN Upgd by Microsoft	\$258
FoxPro V2.6 WIN by Microsoft	\$87

DESKTOP PUBLISHING	
Harvard Graphics V3.0 WIN Upgd by SPC	\$88
Page Magic V1.0 WIN by Naba	\$41
Print Shop Deluxe V2.0 cd ensemble WIN	\$74
Print Shop Deluxe V2.0 WIN	\$48
Publisher V2.0 WIN by Microsoft	\$83

EDUTAINMENT	
Dangerous Creatures V1.0 WIN	\$49
Dinosauria Multimedia V1.0 WIN	\$49
Encarta F/WIN V1995 Multimedia Encyc.	\$81
Cinema4 V1995 WIN by Microsoft	\$49

*Prices include a \$30 Mail-in Rebate from IBM when you buy OS/2 Warp & any DOS, Windows or OS/2 application program. \$30 Rebate offer good thru 8/31/95



The HP Deskjet 660c Printer only \$479

HP PRINTERS	
HP Deskjet 320/540 Printer	\$298/\$219
HP Deskjet 540 Opt. Color Kit	\$39
HP Deskjet 660C Printer	\$479
HP Deskjet 1200C/C PS Printer	\$997/\$1587
HP Deskjet 1600C Printer	\$1349
HP LaserJet 4L/5P Printer	\$499/\$849
HP OfficeJet Printer/Fax/Copier Value Pack \$709	
HP Fax 700 Fax/Copier Value Pack	\$579

PANASONIC PRINTERS	
KX-P4400/P5400	\$339*/\$474
KX-P4430	\$659
KX-P4440	\$989
KX-SP100 Printer/Fax/Copier	\$764
KX-P1150/P2023	\$129/\$175
KX-P3123/P3124	\$245/\$315
KX-P2130/P2135	\$169*/\$195*
KX-P3696/P3626	\$399/\$389

*Price includes Manufacturer Rebate

PRINTERS

CANON	
BJ-30	\$257
BJ-200ex/230	\$229/\$384
BJC-70/BJC-60A	\$354/\$458
BJC-4000	\$347
LB-P430W/LBP-1260	\$444/\$1267

TEXAS INSTRUMENTS	
microlaser 600	\$854
microlaser Pro 600 PS23	\$1167
microlaser Pro E/Power Pro	\$1347/\$1597

DIGITAL	
DECWriter 90ip/120ic	\$299/\$279
DECColorwriter 550ic	\$329
DECcolor 5100	\$1149
DEC 3500	\$1799/\$1799

LEXMARK	
4039 LaserPrinter 10 plus	\$1249
Optra R/Rx	\$1449/\$2025
Optra L/Lx/Lxi	\$1909/\$2475/\$3039
WinWriter 150c	\$359
Exceljet Ixi	\$299
2380/2381 Plus Dot Matrix	\$327/\$439
2390/2391 Plus Dot Matrix	\$347/\$439
4226 Dot Matrix	\$1299
IBM Color Jet Printer 4079 Plus	\$2589

EPSON

ACTION Laser 1100/1400	\$379/\$499
UX300	\$175
LQ-570+/1070+	\$254/\$407
FX-870/1170	\$304/\$404
LQ-300/870/1170	\$189/\$447/\$687
LQ-2550 Cx	\$967
DFX-5000+/8000	\$1534/\$2577
Stylus 800+/1000	\$219/\$479
Stylus Color	\$529

OKIDATA PRINTERS

OL400E/OL410E	\$349*/\$544
ML320I/ML321I	\$319/\$449
ML590I/ML591I	\$449/\$609
Okijet 2010	\$375
OL810E	\$799

*Price includes \$30 Mail-In Rebate

BROTHER

HL-630/HL-645	\$389/\$439
HL-655M/HL-660	\$579/\$629*
HL-960/HL1260	\$999/\$1219
MFC-4000ML	\$885
MFC-4500ML	\$959

*With \$50 Rebate

MONITORS & VIDEO CARDS

PANASONIC

14" PanaSync C1491	\$249
15" PanaSync C-1591E	\$399
17" PanaSync C-1791E	\$699
21" PanaSync C-2192P	\$1699
15" PanaMedia	CALL
17" PanaMedia	CALL

MAGNAVOX

14" M479(mon)	\$111
14" CM2089	\$235
14" CM2099	\$248
15" CM2015	\$323
15" CM4015	\$378
17" CM4018	\$665
20" 20CM64	\$1099
20" CM5600	\$1549

ATI TECHNOLOGY

Graphics Xpression 2MB ISA/VLB/PCI	\$195
WinTurbo 2MB ISA/VLB/PCI	\$285
Graphics Pro Turbo 2MB ISA/VLB/PCI	\$285
Graphics Pro Turbo 4MB ISA/VLB/PCI	\$465

CTX

14" 1451C	\$239
15" 1562CL	\$339
15" 1565CD	\$349
17" 1765CD	\$639
17" 1785GME	\$719
20" 2005	\$1159

MAG INNOVISION

14" iX1450LG	\$259
15" DX15FE	\$389
17" DX17FE	\$699
17" MX17FE	\$869
21" MX21FE	\$1799

SONY

14" CPD-145F	\$299
15" CPD-155F	\$499
17" CPD-175F	\$878
17" GDM-175E1	\$1119
20" GDM-205E1	\$1999

DIAMOND

SpeedStar Pro 1MB ISA/VLB	\$95
SpeedStar 64 1MB ISA*	\$145
SpeedStar 64 2MB ISA*	\$199
Stealth SE 1MB VLB/PCI DRAM	\$104
Stealth Video DRAM* 1MB	\$169
Stealth Video DRAM* 2MB	\$229
Stealth 64 Video VRAM 2MB VLB/PCI**	\$335
Stealth 64 Video VRAM 4MB VLB/PCI**	\$479

*Includes Corel Draw 3.0 **Includes Corel Draw 4.0

PRINCETON GRAPHICS

Ultra 14	\$199
Ultra 14NI	\$249
Ultra 15	\$349
Ultra 17	\$629

MODEMS & PC CARDS

HAYES	
PC Card Optima 14.4+FAX	\$179
PC Card Optima 28.8 V.34 +Fax 14.4	\$349
Accura 144+FAX144 int/est	\$92/\$109
Accura 288V.F.C+FAX int/est	\$185/\$219
Optima 144+FAX144 int/est	\$375/\$375
Optima 288 V.F.C+FAX int/est	\$369/\$475
ESP Communications Accelerator	\$75

US ROBOTICS	
Sportster 14.4 Fax int/est	\$95/\$109
Sportster 14.4 PC Card	\$179
Sportster V.34 int/est	\$219/\$239
Courier Dual Standard 14.4 PC Card	\$349
Courier V.34 int/est	\$379/\$475
Courier Dual Std 28.8 PC Card	\$399

BOCA	
14.4 w/FAX internal	\$79
external	\$99
Int.Mult. Voice Modem w/VoiceView	\$125
Sound Expression 14.4/16bit Sound	\$159
V.34 28.8 bps Modem internal	\$159
external	\$179
Complete Office Communicator	\$145

MEGAHERTZ	
PC Card 14.4/14.4 XJACK	\$175
PC Card 14.4/14.4	\$175
PC Card Gold Series XJACK 14.4/14.4	\$199
PC Card Gold Series 14.4/14.4	\$199
PC Card Ethernet Modem	\$345
PC Card Ethernet Modem XJACK	\$359
PC Card 28.8/14.4	\$319
PC Card 28.8/14.4 w/XJACK	\$319

MULTIMEDIA & CD ROM

FLEX	
FLEX CD Drive Upgrade Kit	\$119
FLEX CD-PRO Value	\$199
FLEX CD-Pro External	\$219

NEC	
MultiSpin 2XC/3XP Plus	\$459/\$379
MultiSpin 6X/8X	\$454/\$544

CREATIVE LABS

Blaster CD 4X	\$199
Discovery CD New Edition	\$259
Discovery CD 4X	\$369
Digital Schoolhouse 4X	\$299
Multimedia Home 4X	\$449
Sound Blaster Pro Value Edition	\$49
Sound Blaster Value Edition	\$69
SoundBlaster Value IDE	\$99
SoundBlaster 32	\$159
Sound Blaster Value CD	\$185
Sound Blaster AWE32	\$299
SoundBlaster Performance 4X	\$429
Advanced Signal Proc Upgrade Kit	\$55
Wave Blaster II	\$145
Voice Assist	\$29
PhoneBlaster	\$249
PhoneBlaster Value	\$49

DIAMOND

Multimedia Kit 2000 / 3000	\$379/\$369
Multimedia Kit 4000 / 5000	\$335/\$439
Multimedia Kit 6000	\$385

MICROSOLUTIONS

Back Pack Portable 4x	\$379
-----------------------------	-------

MEDIAVISION

Reno Portable CD-ROM	\$399
----------------------------	-------

ADS

Remote Mouse Plug	\$69
TV Elite int / est	\$135/\$199
Audio Rock-it / Radio Rock-it	\$59/\$199
PC Primetime	\$279

TURTLE BEACH

MonteCarlo	\$89
Rio/Tropez	\$139/\$195
Monterey/Entertainer	\$329/\$369

AI TECH

MultiPro CTV / ProCTV Plus	\$235/\$145
WaveWatcher TV	\$309
Wireless Bandit Game Control	\$49

ALTEC LANSING

ACS51	\$75
-------------	------

JENSEN/POWER PARTNERS

JPS35/JPS45	\$59/\$99
AR22/AR42	\$69/\$99
AR570	\$259

PANASONIC

EAB401P Speakers	\$49
EAB710P Speakers	\$89
KXL-D720 Portable CD-ROM	\$299
UK-MC604S 4X CD-ROM	\$399

SONY

SRS-SP0C	\$89
CSS-B100	\$99
SRS-DKPC	\$159
CSD 760E (Quad Speed)	\$209
CSD 760S (Quad Speed)	\$225

TEAC

CD-55A (Quad Speed)	\$219
---------------------------	-------

PLECTOR

FX-63CX 6X CD-ROM	\$489
-------------------------	-------



NEC Multisync X Series From \$307

NEC	
14" MultiSync XV14	\$307
15" MultiSync XV15	\$424
17" MultiSync XV17	\$727
15" MultiSync XE15	\$524
17" MultiSync XE17	\$964
21" MultiSync XE21	\$1767
15" MultiSync XP15	\$577
17" MultiSync XP17	\$1027
21" MultiSync XP21	\$2137

HERCULES

Stingray Pro 1MB VLB/PCI	\$99
Graphite Terminator DRAM 2MB VLB/PCI	\$179
Graphite Terminator Pro 2MB VLB/PCI	\$339
Graphite Terminator Pro 4MB VLB/PCI	\$479

EPSON

15" SVGA .28	\$329
17" SVGA .28	\$599

NOKIA

17" 447L	\$674
17" 447X	\$974
21" 445X	\$2184

TOSHIBA *Satellite*[®]

GET THE BEST IN IT'S CLASS FOR BACK-TO-SCHOOL
WITH USA FLEX AND TOSHIBA.

Purchase a Toshiba Satellite notebook and receive a coupon for a FREE PC Backpack filled with special savings certificates and rebate offers from American Airlines[®], Hewlett Packard, Avis, Best Western, America Online, Fuji and more...

UP TO A \$365 VALUE!

"Back to School" PC Backpack offer expires 9/17/95.
Offer good while supplies last.

Satellite Pro
T2150CDS

Satellite
T2100

Satellite
T2100CS

Satellite T2100

- Intel 486 DX2-50
- 9.5" Mono Passive
- 260MB • 4MB RAM

PA11760-A2A

\$1377

Satellite T2100CS

- Intel 486 DX2-50
- 10.4" Color Dual Scan
- 350MB • 4MB RAM

PA11790-S2A

\$1954

Satellite T2100CT

- Intel 486 DX2-50
- 8.4" Color Active
- 350MB • 8MB RAM

PA11810-T2A

\$2647

Satellite T2110CS

- Intel 486 DX4-75
- 10.4" Color Dual Scan
- 350MB • 4MB RAM

PA13080-S2A

\$2167

Satellite T2130CS

- Intel 486 DX4-75
- 10.4" Color Dual Scan
- 520MB • 4MB RAM

PA11960-S2A

\$2497

Satellite T2130CT

- Intel 486 DX4-75
- 10.4" Color Active
- 520MB • 8MB RAM

PA11980-T2A

\$3014

Satellite T2130CS

Satellite Pro 400CS

- Intel Pentium 75
- 10.4" Color Dual Scan
- 810MB • 8MB EDO RAM

PA12070-S2A

\$3877

Satellite Pro 400CT

- Intel Pentium 75
- 10.4" Color Active
- 810MB • 8MB EDO RAM

PA12090-T2A

\$4684

Satellite Pro T2150CDS

- Intel 486 DX4-75
- 10.4" Color Dual Scan
- 520MB • 4 MB RAM

PA11840-S2A

\$3037

Satellite Pro T2150CDT

- Intel 486 DX4-75
- 10.4" Color Active
- 520MB • 8MB RAM

PA11980-T2A

\$3627

Satellite Pro T2450CT

- Intel 486 DX4-75
- 9.5" Color Active
- 340MB • 8MB RAM

PA11900-T2A

\$2974

Satellite Pro T2450CT

- Intel 486 DX4-75
- 9.5" Color Active
- 520MB • 8MB RAM

PA11910-T2A

\$3074

OTHER MODELS AVAILABLE FROM:

TOSHIBA

Protege 610CT

- Intel Pentium 90
- 9.5" Color Active
- 720MB • 8MB EDO RAM

PA11230-T9A

\$4267

T4900CT

- Intel Pentium 75
- 10.4" Color Active
- 810MB • 8MB EDO RAM

PA12050-T2A

\$4674

T4850CT

- Intel 486 DX4-75
- 10.4" Color Active
- 520MB • 8MB RAM

PA11720-T2A

\$3247

• 810MB • 8MB

PA11740-T2A

\$3397

USA★FLEX
1-800-766-1940
(708)582-6206 Fax: (708) 351-7204
444 S. Scott Drive
Bloomington, IL 60108

CIRCLE 085 ON READER SERVICE CARD
CREATE OR ON WEBER SERVICE CARD

CODE #PM08AS

Get Three for the Road and Save \$1.40



Includes the HP OmniBook 4000CT Notebook,
the HP DeskJet 320 Printer,
and a Cellular Compatible 14.4/14.4
PC CARD Data/Fax Modem

[illegible][illegible]

HP DeskJet 320
Printer Includes
Sheet Feeder
and Color Ink

HP OmniBook Notebooks

Model	CPU	Display	RAM	Hard Drive	Part #	Price
600C	Intel 486 DX2-50	8.5" Dual Scan	4MB	260MB*	F1065A	\$2364
600C	Intel 486 DX4-75	8.5" Dual Scan	8MB	260MB*	F1111A	\$2984
4000C	Intel 486DX2-50	10.3" Dual Scan	4MB	260MB*	F1081A	\$2317
4000C	Intel 486DX4-100	10.3" Dual Scan	8MB	340MB*	F1086A	\$2937
4000CT	Intel 486DX2-50	10.4" Active Matrix	8MB	340MB*	F1094A	\$2647
4000CT	Intel 486DX4-100	10.4" Active Matrix	8MB	520MB*	F1089A	\$3544
4000CT	Intel 486DX4-100	10.4" Active Matrix	8MB	810MB*	F1097A	\$3827
5000CT	Intel Pentium 90	10.4" Active Matrix	8MB	1.0GB	F1130A	CALC

* These results available with other hard drives. Ask your EISA representative for details.

\$2999
All For Only



aveMate™ 4000M

- Intel 486-75MHz CPU • 9" 4" Active Color Display
 - 455MB Hard Drives • 4MB RAM (Maximum 20)
 - High performance video Accelerator
 - 2 Type II or 1 Type II PCMCIA slots
 - Built-in 16 bit Sound Internal Speaker & Microphone (Sound S/W Included)
 - 8 5" x 11" x 19" • 64 lbs • 1 Year Warranty
- Special Price
\$229

Special
Price
\$2299

Model	CPU	Color Display	RAM (Max)	Hard Drive	Part #	Price
T4000M	486 DX4-75	10.5" Dual Scan	4MB (20)	455MB	9794095-0001	\$2427
T4000M	486 DX4-75	9.5" Active	4MB (20)	455MB	9794061-0019	\$2299
T4000M	486 DX4-75	10.5" Active	4MB (20)	524MB	9794093-0001	\$2757
T4000M	486 DX4-100	10.5" Active	4MB (20)	524MB	9800258-0001	\$3427
T5000	Pentium 75	10.5" Dual Scan	8MB (32)	524MB	9798848-0001	\$3847
T5000	Pentium 75	10.4" Active	8MB (32)	810MB	9798842-0001	\$4517



New! NEC
Versa2000D

486DX4-75, 10.4" Color Display, 350MB HD,
4MB RAM (Max 36), Int 14.4 Data/Fax Modem

Only \$1857!

Only

Verse 2000D	486 DX4-75, 10.4" Color Dual Scan, 350MB HD	\$1857
Verse 2000C	486 DX4-75, 10.4" Color Dual Scan, 350MB HD	\$2414
Verse V/50D	486 DX2 50, 9.5" Color Active Scan 250MB HD	\$2084
Verse V/50C	486 DX2 50, 9.5" Color Active, 250MB HD *	\$2224
Verse V/50C	486 DX2 50 9.5" Color Active, 540MB HD *	\$2594
Verse V/75C	486 DX4-75, 9.5" Color Active, 540MB HD *	\$2687
Verse M/75D	486 DX4-75, 9.5" Color Dual Scan, 250MB HD	\$2297
Verse M/75D	486 DX4-75, 9.5" Color Dual Scan, 340MB HD	\$2397
Verse M/75C	486 DX4-75, 9.5" Color Active, 340MB HD *	\$2687

Version M/75C	486 DX4-75, 9.5" Color Active, 540MB HD*	... \$2967
Version M/100C	486 DX4-100, 9.5" Color Active, 810MB HD*	... \$3987
Version M/100HC	486 DX4-100, 9.5" Color Act Hi-Res, 540MB*	\$3797
Version P/75C	Pentium 75, 9.5" Color Active, 540MB HD*	... \$3987
Version P/75C	Pentium 75, 9.5" Color Active, 540MB HD*	\$4267
Version P/75C	Pentium 75, 10.4" Color Active, 540MB HD*	... \$4544
Version P/75C	Pentium 75, 10.4" Color Active, 810MB HD*	... \$4914
Version P/75HC	Pentium 75, 9.5" Color Active Hi-Res, 810MB HD*	\$4824
Version P/75HC	Pentium 75, 10.4" Color Active Hi-Res, 810MB HD*	\$5097

* These models available with other hard drives. Ask your Flex representative for details.



**New
Lower
Prices!**

COMPAQ
The LTE Elite
From only **\$2624!**

From only **2024!**
Special Offer!

Compaq Ltd. Info 4/7/93

Model	CPU	Color Display	RAM (Max)	Hard Drive	Part #	Price
Elite 4/50CX	486 DX2-50	9.5" Active	8MB (32)	340MB	197800-005	\$3754
Elite 4/75C	486 DX4-75	9.5" Dual Scan	8MB (32)	340MB	189850-005	\$2674
Elite 4/75C	486 DX4-75	9.5" Dual Scan	8MB (32)	510MB	189850-006	\$3047
Elite 4/75CX	486 DX4-75	9.5" Active	8MB (32)	340MB	149500-005	\$3927*
Elite 4/75CX	486 DX4-75	9.5" Active	8MB (32)	510MB	149500-006	\$4297*
Elite 4/75CXL	486 DX4-75	10.4" Active	8MB (32)	510MB	197900-006	\$4057
Elite 4/75CXL	486 DX4-75	10.4" Active	8MB (32)	810MB	197900-007	\$4427

*Includes FREE Campa SmartStation



IBM® THINKPAD® 701 SERIES

THINK SMART.
THINKPAD.

New
Lower Prices!

701CS

- Intel 486DX2-50
- 10.4" Color Dual Scan
- 4MB • 360MB

2630US2 **\$2949**

2630US5 **\$3199**

701CS

- Intel 486DX4-75
- 10.4" Color Dual Scan
- 8MB • 360MB

26302SU1 **\$3549**

26305SU1 **\$3849**

701C

- Intel 486DX2-50
- 10.4" Color Active
- 4MB • 360MB

2630UT2 **\$3699**

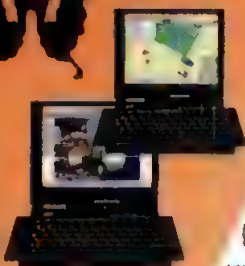
2630LT5 **\$4049**

701C

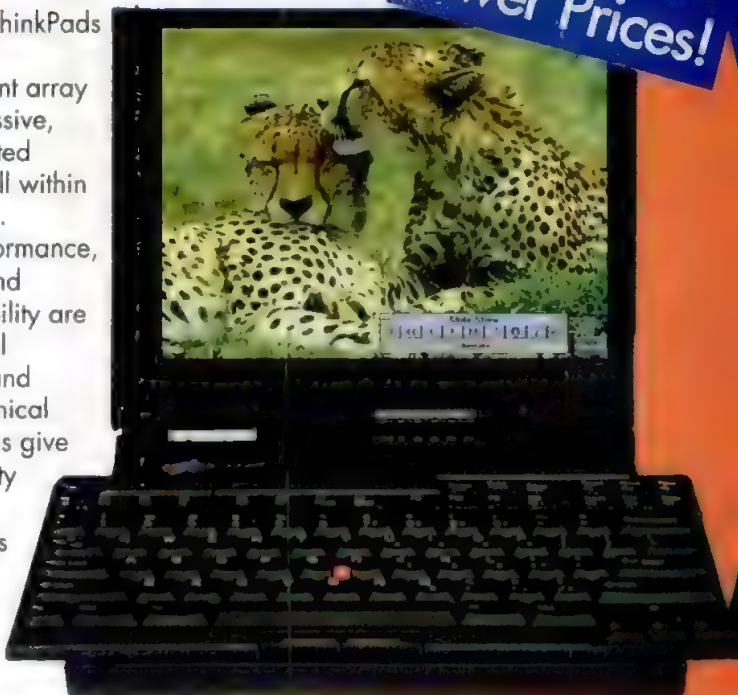
- Intel 486DX4-75
- 10.4" Color Dual Scan
- 8MB • 360MB

26302TU1 **\$4299**

26305TU1 **\$4599**



IBM ThinkPads put an intelligent array of impressive, sophisticated features well within your budget. Top-level performance, sleek design, and unmatched reliability are all backed by a full one-year warranty and 'round the clock technical support. IBM ThinkPads give your powerful portability at a lightweight price! And now USA Flex offers you the new ThinkPad 701 Series at new lower prices, for those who want ultimate portability without sacrificing power and performance.



THE IBM THINKPAD 755 SERIES

Model	CPU	Display	RAM	Hard Drive	Part #	Price
755C	Intel 486DX2-50	10.4" Color Active	4MB	340MB*	9545F0E	\$2569
755C	Intel 486DX2-50	10.4" Color Active	4MB	540MB	9545F0G	\$2879
755C	Intel 486DX4-75	10.4" Color Active	4MB	340MB	9545I0E	\$3369
755C	Intel 486DX4-75	10.4" Color Active	4MB	540MB	9545I0G	\$3699
755CE	Intel 486DX4-100	10.4" Dual Scan	8MB	340MB	954568C	\$3499
755CE	Intel 486DX4-100	10.4" Color Active	8MB	340MB	954578C	\$4299
755CD	Intel 486DX4-100	10.4" Color Active	8MB	540MB	954598D	\$5649
755CX	Intel Pentium 75	10.4" Color Active	8MB	540MB	9545S8J	\$4749

*USA Flex carries the full line of IBM ThinkPad Notebooks.

Genuine IBM PC Card

14.4Kbps/14.4Kbps Data/Fax Modem with Integrated DAA, V.42bis, MNP-5. Advanced power management for battery conservation. Auto-dialing; ring detect in "sleep" mode.

\$189

73G7097

THINKPAD® CARRYING CASES from PORT®

...The only case endorsed by IBM®



IBM Standard Form
Laptop/Notebook



ThinkPad Compact
Carrying Case

\$89

A light weight, compact case made of premium ballistic nylon with a removable pouch and front compartment.

1PG7000



ThinkPad Standard
Carrying Case

\$115

Lightweight with impressive carrying capacity. Made of premium ballistic nylon, allows room for plenty of accessories.

1PG6000

\$169

TP70100

- Full grain leather
- Padded handles
- Ergonomic removable shoulder strap
- Die-cast metal hardware
- Front pocket holds up to 3 files
- Shock-Absorbing Suspension System
- Integrated Wrist Rest

The compact and attractive carrying case designed to hold and protect your notebook... no matter what brand you own.

\$99

696BLK



USA★FLEX
1-800-766-1940
(708)582-6206 Fax: (708) 351-7204
444 Scott Drive
Bloomington, IL 60108



```

@ECHO OFF
IF '%2'=='' GOTO Syntax
ECHO N DISK$PAC.$$$> DISKSPAC.SCR
ECHO RBX>> DISKSPAC.SCR
ECHO %1>> DISKSPAC.SCR
ECHO RCX>> DISKSPAC.SCR
ECHO %2>> DISKSPAC.SCR
ECHO W>> DISKSPAC.SCR
ECHO Q>> DISKSPAC.SCR
DEBUG < DISKSPAC.SCR > NUL
DEL DISKSPAC.SCR
IF NOT EXIST DISK$PAC.$$$ GOTO NoRoom
DEL DISK$PAC.$$$
ECHO Requested disk space is available
GOTO End
:NoRoom
ECHO Requested disk space is not available
:End

```

Figure 1: This batch file checks whether a specified amount of disk space is available; the amount must be specified as an eight-digit hexadecimal number, split into two four-digit halves.

(base 16). That's not such bad news, though. The Windows Calculator's Scientific view has the ability to convert numbers to hex, and you'll need to make the calculation only once for each specific amount of space you're checking.

Here's what you do. Suppose the system needs 800,000 bytes of disk space.

First, convert that number to hex (C3500) and pad it on the left with zeros to make eight digits (000C3500). Now split the number in two and pass the two halves to DISKSPAC.BAT (Figure 1), like this:

```
DISKSPAC 000C 3500
```

DISKSPAC.BAT uses a DEBUG script to create a dummy file of the specified size. If it succeeds, it deletes the file and reports that sufficient space was available. If it fails, the batch file simply reports that there wasn't enough space. Of course, creating the humongous file will take a few seconds, but you'll know that the necessary space is available.—Neil J. Rubenking

WORD PROCESSING

Prettier WinWord Tables

TIP Your column of November 8, 1994, discussed how to use WinWord's drawing tools to make cells in a WinWord table

appear as if they are merged vertically. Here's an extension of that technique. For truly professional-looking tables, you'll sometimes want the text in the leftmost column to print in a landscape orientation relative to the rest of the table, as in the top table in Figure 2. To add the landscape text, first place a text box in the table as described in the original tip. But instead of simply typing the text, insert a WordArt object and format it using the bottom-to-top shape, which you'll find at the extreme right of the first row on the Shape pull-down menu.

William Newton
Madrid, Spain

PC MAGAZINE: There's no reason to limit yourself to vertical text, either. As the bottom table in Figure 2 shows, you can easily insert more creative effects using WordArt. In fact, you don't have to limit yourself to text at all; you can also insert graphics in a text box.

For those who missed the original tip, the underlying technique is to add a text box to cover two or more cells in a table,

Premier Superstores Top Direct Marketers Manufacturers of Systems, Software, and Peripherals If it's sold direct, you'll find it here.		INDEX <table border="1"> <thead> <tr> <th colspan="2">SYSTEMS</th><th colspan="2"></th></tr> </thead> <tbody> <tr> <td>AMS</td><td>476</td><td>Arlington Computer Products</td><td>472</td></tr> <tr> <td>CompUSA</td><td>480</td><td>COMPUTER DISCOUNT</td><td></td></tr> <tr> <td>COMPUTER DISCOUNT</td><td></td><td>WAREHOUSE</td><td>460</td></tr> <tr> <td>WAREHOUSE</td><td>460</td><td>First Source International</td><td>456</td></tr> <tr> <td>Ergo Computing, Inc.</td><td>474</td><td>HARTFORD COMPUTER GROUP</td><td>449</td></tr> <tr> <td>FOSA Computer Inc.</td><td>455</td><td>INSIGHT DIRECT, INC.</td><td>486</td></tr> <tr> <td>HARTFORD COMPUTER GROUP</td><td>449</td><td>LA Trade</td><td>452</td></tr> <tr> <td>INSIGHT DIRECT, INC.</td><td>486</td><td>Megahaus</td><td>490</td></tr> <tr> <td>Magitronic</td><td>454</td><td>Micro Solutions</td><td>450</td></tr> <tr> <td>Midwest Micro Peripherals</td><td>437</td><td>Micron Computer, Inc.</td><td>482</td></tr> <tr> <td>MPC Technology</td><td>466</td><td>Midwest Computer Works</td><td>478</td></tr> <tr> <td>PCs Compleat</td><td>467</td><td>PC Connection</td><td>484</td></tr> <tr> <td>PerComp Microsystems, Inc.</td><td>434</td><td>Pro Direct</td><td>433</td></tr> <tr> <td>Sys Technology</td><td>447</td><td>SPSS, Inc.</td><td>483</td></tr> <tr> <td>USA Flex</td><td>423</td><td>Sunshine Computers</td><td>446</td></tr> <tr> <td colspan="2">SOFTWARE/PERIPHERALS/ COMPONENTS</td><td>TechWorks</td><td>475</td></tr> <tr> <td>APS Technologies</td><td>445</td><td></td><td></td></tr> </tbody> </table>		SYSTEMS				AMS	476	Arlington Computer Products	472	CompUSA	480	COMPUTER DISCOUNT		COMPUTER DISCOUNT		WAREHOUSE	460	WAREHOUSE	460	First Source International	456	Ergo Computing, Inc.	474	HARTFORD COMPUTER GROUP	449	FOSA Computer Inc.	455	INSIGHT DIRECT, INC.	486	HARTFORD COMPUTER GROUP	449	LA Trade	452	INSIGHT DIRECT, INC.	486	Megahaus	490	Magitronic	454	Micro Solutions	450	Midwest Micro Peripherals	437	Micron Computer, Inc.	482	MPC Technology	466	Midwest Computer Works	478	PCs Compleat	467	PC Connection	484	PerComp Microsystems, Inc.	434	Pro Direct	433	Sys Technology	447	SPSS, Inc.	483	USA Flex	423	Sunshine Computers	446	SOFTWARE/PERIPHERALS/ COMPONENTS		TechWorks	475	APS Technologies	445		
SYSTEMS																																																																											
AMS	476	Arlington Computer Products	472																																																																								
CompUSA	480	COMPUTER DISCOUNT																																																																									
COMPUTER DISCOUNT		WAREHOUSE	460																																																																								
WAREHOUSE	460	First Source International	456																																																																								
Ergo Computing, Inc.	474	HARTFORD COMPUTER GROUP	449																																																																								
FOSA Computer Inc.	455	INSIGHT DIRECT, INC.	486																																																																								
HARTFORD COMPUTER GROUP	449	LA Trade	452																																																																								
INSIGHT DIRECT, INC.	486	Megahaus	490																																																																								
Magitronic	454	Micro Solutions	450																																																																								
Midwest Micro Peripherals	437	Micron Computer, Inc.	482																																																																								
MPC Technology	466	Midwest Computer Works	478																																																																								
PCs Compleat	467	PC Connection	484																																																																								
PerComp Microsystems, Inc.	434	Pro Direct	433																																																																								
Sys Technology	447	SPSS, Inc.	483																																																																								
USA Flex	423	Sunshine Computers	446																																																																								
SOFTWARE/PERIPHERALS/ COMPONENTS		TechWorks	475																																																																								
APS Technologies	445																																																																										

ProDirect

800-524-9952

Fax 24 hours a day 612-941-1109
International orders call 612-941-1805

Professional Service...Products Direct

Professional Service...

- Over 10 years experience in the hard drive market!
- Extremely knowledgeable sales and technical support staff
- Complete line of products available from major manufacturers!
- Always call for the most competitive pricing.

CD ROM DRIVES

	Int.	Ext.
NEC 2Vi SCSI 320ms access, 300Kb/sec transfer	165	245
CHINON CDA525 Dual Speed SCSI 280ms access, 300Kb/sec transfer	165	225
SONY CDU-55s Dual Speed SCSI 220ms access, 300Kb/sec transfer	195	255
SONY CDU-55e Dual Speed IDE 220ms access, 300Kb/sec transfer	145	n/a
NEC 3Xp+ SCSI 240ms access, 500Kb/sec transfer	n/a	375
TEAC CD-55 QuadSpeed SCSI 195ms access, 600Kb/sec transfer	225	245
NEC 4Xi/e SCSI 220ms access, 600Kb/sec transfer	365	449
Plextor 4Plex SCSI 235ms access, 600Kb/sec transfer, 256K	335	435
TOSHIBA QuadSpeed SCSI 120ms access, 600Kb/sec transfer	355	415
Plextor 6Plex SCSI 145ms access, 900Kb/sec transfer	535	635

SCSI ADAPTERS

	Advanced Systems
1315A ISA to Fast SCSI 2-16bit	95
1322A ISA to Fast SCSI 2-16bit adapter with SCSI controller	105
1342A ISA to Fast SCSI 2-16bit	225
2742A SCSI to EISA 2-16bit	365
2842A SCSI to EISA 2-16bit	245
2742W SCSI to EISA 2-16bit with SCSI controller	395
1640 SCSI to EISA 2-16bit	395
2940K SCSI to EISA 2-16bit	275
ULTRASTOR 2280 SCSI 2-16bit	29
ULTRASTOR 2290 SCSI 2-16bit	130
ULTRASTOR 3270 SCSI 2-16bit	115
ULTRASTOR 3280 SCSI 2-16bit	225
ULTRASTOR 3290 SCSI 2-16bit	335

FLOPPY DRIVES & KEYBOARDS

	Maxi Switch
MITSUMI 1.2MB 3.5" \$49	101 key enhanced AT \$75
TEAC 3.5" \$39	Keyboards
1.2MB 3.5" \$49	Full line available call for details and pricing!

MODEMS

	Hayes
Robotics Sportster Int/Ext 14.4bps, Data/Fax, with CL II	95/110
Sportster Int/Ext V.34, 28.8 bps with fax	224/242
Sportster Int V.34, PCMCIA 14.4bps	175
Sportster Int V.34, PCMCIA 28.8 bps	335
Courier Int/Ext V.34, 28.8 bps with fax	375/445
Courier Int V.34, PCMCIA 14.4bps	375
Courier Int V.34, PCMCIA 28.8 bps	435
ACCURA 14.4 Int/Ext 14.4bps, Data/Fax	88/108
ACCURA 28.8 Int/Ext 28.8 bps, Data/Fax Async Only	168/208
OPTIMA 14.4 Pocket/Ext 14.4bps, Data/Fax	278/348
OPTIMA 28.8 Int/Ext 28.8 bps, Data/Fax Async Only	338/388
PM14400HCIIV32 Int/Ext 14.4bps, Data/Fax Async Only	88/98
PM288HCIIV34 Int/Ext 28.8 bps, Data/Fax Async Only	178/209

OPTICAL DRIVES

	MaxOptics
FUJITSU 230 MB SCSI M2512 30ms	525
230 MB IDE M2512 30ms	585
230 MB PC DynaMo 30ms	n/a
*Includes Adaptec SCSI host adapter kit	985
230 MB DynaMo 30ms	n/a
1.3 GB SCSI HP17167 23.5ms	885
1.3 GB SCSI Tahn III 18ms	2235
	2295
	2335
	2395

1 free cartridge with each optical drive purchased!

SCANNERS

Nikon Scantouch Transparency Adapter	1299
Coolscan 35mm film scanner	599
UMAX UC630/1260	1399
Vista-S6	675/1240
Powerlook	760
	3250

8:00am-7:00pm (CST)
Mon.-Fri.

All prices are subject to change without notice. Returned orders are subject to a restocking fee. International customers pay all shipping charges. All shipping charges are non-refundable. To return merchandise call for an RMA number. All RMAs must be returned within 10 business days of issuance. Customers are responsible for shipping charges to return product.

Next Day Air on all
internals is just \$7
Guaranteed!

SCSI & IDE HARD DRIVES

						
<u>Model</u>	<u>Capacity</u>	<u>Interface</u>	<u>Seek</u>	<u>RPM</u>	<u>Cache</u>	<u>Int.</u>
Hawk 2LP	1.2 GB	SCSI	9.5ms	5400	512K	\$495
Hawk 4	4.2 GB	SCSI	9ms	5400	512K	1260
Barracuda	2.4 GB	SCSI	8ms	7200	1024K	955
Barracuda	4.2 GB	SCSI	8ms	7200	1024K	1429
Barracuda Wide	2.4 GB	SCSI	8ms	7200	1024K	995
Barracuda Wide	4.2 GB	SCSI	8ms	7200	1024K	1519
Elite	9.0 GB	SCSI	11ms	5400	512K	2650
ST3491A	420 MB	IDE	14ms	3800	256K	160
ST3680A	540 MB	IDE	14ms	3800	256K	170
ST3780A	720 MB	IDE	12ms	4500	256K	225
ST3850A	850 MB	IDE	12ms	4500	256K	230
ST31220A	1.2 GB	IDE	12ms	4500	256K	330

External SCSI units add \$60 comes complete with cables!

CONNER

<u>Model</u>	<u>Capacity</u>	<u>Interface</u>	<u>Seek</u>	<u>RPM</u>	<u>Cache</u>	<u>Int.</u>
CFP1060	1.06 GB	SCSI	10ms	5400	256K	455
CFP2105	2.0 GB	SCSI	8.5ms	5400	512K	850
CFP2107	2.1 GB	SCSI	8.5ms	5400	512K	970
CFP4105	4.0 GB	SCSI	8.5ms	5400	512K	1425
CFS425	425 MB	IDE	10ms	5400	256K	160
CFA540	540 MB	IDE	8.5ms	5400	512K	175
CFA850	850 MB	IDE	8.5ms	5400	512K	235
CFA1275	1.2 GB	IDE	8.5ms	5400	512K	350

External SCSI units add \$60 comes complete with cables!

Quantum

<u>Model</u>	<u>Capacity</u>	<u>Interface</u>	<u>Seek</u>	<u>RPM</u>	<u>Cache</u>	<u>Int.</u>
Trailblazer	420 MB	IDE/SCSI	11 ms	4500	128K	165/175
Fireball*	540 MB	IDE/SCSI	10 ms	5400	128K	195/215
Lightning	730 MB	IDE/SCSI	11 ms	4500	128K	235/245
Trailblazer	850 MB	IDE/SCSI	11 ms	4500	128K	240/270
Fireball*	1080 MB	IDE/SCSI	10 ms	5400	128K	375/410
Atlas	2.1 GB	SCSI	8 ms	7200	1024K	890
Grand Prix	4200 MB	SCSI	8.6 ms	7200	512K	1175
Atlas	4.3 GB	SCSI	8 ms	7200	2048K	1495

*Drives with MR Head Technology gives you increased transfer rates
External SCSI units add \$60 comes complete with cables!

WESTERN DIGITAL

<u>Interface</u>	<u>Seek</u>	<u>RPM</u>	<u>Cache</u>	<u>Int.</u>	<u>Model</u>	<u>Capacity</u>
WD2540A	540 MB	IDE	11ms	5400	256K	195
WD2850A	850 MB	IDE	10ms	5400	512K	230
WD31200	1.2 GB	IDE	10ms	5400	512K	350
WD3160	1.6 GB	IDE	10ms	5400	512K	645

5 Year Advance Replacement!			MICROPOLIS			
<u>Model</u>	<u>Capacity</u>	<u>Interface</u>	<u>Seek</u>	<u>RPM</u>	<u>Cache</u>	<u>Int.</u>
M4221	2.1 GB	SCSI	8.5 ms	7200	512K	915
M1936	3.6 GB	SCSI	11 ms	5400	512K	1225
M3243	4.3 GB	SCSI	8.5 ms	7200	512K	1315
M1991	9.0 GB	SCSI	11 ms	5400	512K	2150
M4221Wide	2.1 GB	SCSI	8.5 ms	7200	512K	1035
M3243Wide	4.3 GB	SCSI	8.5 ms	7200	512K	1445
M1991Wide	9.0 GB	SCSI	11 ms	5400	512K	2250
M4221AV	2.1 GB	SCSI	8.5 ms	7200	512K	975
M1936AV	3.6 GB	SCSI	11 ms	5400	512K	1275
M3243AV	4.3 GB	SCSI	8.5 ms	7200	512K	1425
M1991AV	9.0 GB	SCSI	11 ms	5400	512K	2265
M4221WideAV	2.1 GB	SCSI	8.5 ms	7200	512K	1085
M3243WideAV	4.3 GB	SCSI	8.5 ms	7200	512K	1525
M1991WideAV	9.0 GB	SCSI	11 ms	5400	512K	2395

LT Super Capacity Removable Cartridge External Storage

M2100	2.1 GB SCSI	8.9 ms	7200	512K	5 Year	Call
M4300	4.3 GB SCSI	8.9 ms	7200	512K	5 Year	Call

FUJITSU

Model	Capacity	Interface	Seek	RPM	Cache	Int.
M2684	530 MB	SCSI	9ms	4500	256K	215
M1606	1.2 GB	SCSI	9ms	5400	512K	450
M2915	2.1 GB	SCSI	9ms	5400	512K	945

External SCSI units add \$60 comes complete with cables!

SCSI HARD DRIVE CABINETS

Deskcab™	5.25" or 3.5" half ht open/closed bezel HD enclosure	\$75
Minicab™	3.5" half ht open/closed bezel HD enclosure	\$89
Full Height Cab	5.25" full height cab	\$139
Multi Bay Cabinets	5.25" and 3.5" cabinets available	\$CALL
Two, four, six, and eight bay cabinets available. All cabinets come with a 25-50 pin Mac system cable and a power cable. 1 year warranty on all cabinets.		

- No Surcharge on Credit Cards!
- No out of state sales tax collected
- Same day shipping on most products advertised!
- Complete inventory of system brackets and bezels to simplify installation.
- All product tested before shipping to ensure plug and play convenience.

Products & Replacements Direct

- DIRECT REPLACEMENT from the factory on all defective hard drives for the life of the warranty!
- Factory sealed replacement drives.
- Factory trained engineers to assist you.

REMOVABLE STORAGE

		SyQuest			
<u>Capacity</u>		<u>Seek</u>	<u>RPM</u>	<u>Int.</u>	<u>Ext.</u>
88 MB	SCSI	20ms	3200	300	360
200 MB	SCSI	18 ms	3200	420	480
270 MB	SCSI	13.5ms	3200	420	480
270 MB	IDE	13.5ms	3200	420	n/a
<u>Cartridges</u>					
44 MB	SQ400			41	
88 MB	SQ800			47	
105 MB	SQ310			53	
200 MB	SQ2000			75	
270 MB	SQ327			63	

One free cartridge with each SyQuest drive purchased

NETWORK CARDS & HUBS

3Com

Etherlink III 10BT	138/168
Etherlink III 10BT	110/125
Etherlink III 5	478/527
Etherlink III 20	Call
Etherlink III Collect	225
Etherlink III Collect	225
Etherlink III Collect	110
Etherlink III Collect	63

Xircom

CCIPS	268
CCIPS Combo	298
CCIPS Token Ring	454
Pocket III	268
Parallel Port	77
BEN210	133
BEN220	265

TAPE BACKUP DRIVES

250 MB IDE	\$149	n/a
350 MB IDE	\$189	n/a
1.4 GB IDE	\$399	n/a
1.05 GB SCSI	\$799	859

2.0 GB SCSI	\$835	\$885
4-10 GB SCSI	1225	1285
20-50 GB Auto Tape Loader SCSI	3195	3295

420 MB IDE	\$175	n/a
850 MB IDE	\$260	n/a

2 GB SCSI	845	955
4 GB SCSI	995	1095
2-5 GB SCSI	1425	1495
7-14 GB SCSI	2250	2310

Mountain

250 MB IDE	155	n/a
305 MB IDE	310	n/a
700 MB IDE	475	n/a
1 GB SCSI	1675	1775
4 GB SCSI	1945	2045

Quantum DLT SCSI

Model	Capacity	Trans Rate	Media	Price/Ext
DLT2000	20GB	2.5MB/sec	DLT20	3995
DLT4000	40GB	3MB/sec	DLT40	Call

Tape backup drives include 1 piece of media and Novaback backup software for DOS or Windows
Cheyenne backup software also available-call for details

MEDIA

We carry a full line of DAT (4mm & 8mm), optical, SyQuest, and DLT media! Call for the best deals on media. We will meet your media needs!

PERCOMP™

With the PerComp™ advantage.

Deadlines, commitments and obligations can't be overlooked. PerComp™ meets all your requirements with our exclusive Three Year "TRUE SUPPORT" program designed to help you meet all your needs, and never leave you in deep water.

- Three Year "TRUE SUPPORT" On All Systems
- Full Year On Parts And Labor Provided On-Site Nationwide
- 30 -Day Satisfaction Guarantee
- 24-Hours-a-day, 7 Days A Week, Hardware Support
- Lifetime, Toll-Free Technical Support
- 24 Hours-a-day, 7 Days A Week Software Support



PERCOMP

Microsystems Inc.

- \$1,899**
- Intel® 75MHz Pentium™ Processor
 - 8MB RAM, 256Kb Cache
 - 540MB Enhanced IDE, 10ms. Hard Drive
 - PCI Fast IDE Interface
 - PCI Local Bus Graphics with 1MB

CD-ROM Drive
Bundle

- Encarta '95, Works, Money,
- Dangerous Creatures, Arcade,
- Best of Windows Entertainment Pak
- 16-bit Stereo Sound Card
- Premium Speaker System
- 3.5" Floppy Disk Drive
- 15" SVGA .28dp, Digital Color Monitor
- Desktop or Mini Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- PerComp 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 & WFW 3.11
- 24-Hours 7-Days a week Hardware & Software Support
- "TRUE" 3 Year Support

\$1,999 Intel® 90MHz Pentium™ Processor

\$2,149 Intel® 100MHz Pentium™ Processor

- \$2,799**
- Intel® 100MHz Pentium™ Processor
 - 16MB RAM, 256Kb Cache
 - 540MB Enhanced IDE, 10ms. Hard Drive
 - PCI Fast IDE Interface

4 PCI
Slots

- QUAD Speed CD-ROM Drive
- Lotus 123 & Ami Pro
- Lotus Freelance Graphics
- Lotus Approach & Organizer
- 16-bit Stereo Sound Card
- Premium Speaker System
- 3.5" Floppy Disk Drive
- 15" SVGA .28dp, Digital Color Monitor
- Desktop or Mini Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- PerComp 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 & WFW 3.11
- 24-Hours 7-Days a week Hardware & Software Support
- "TRUE" 3 Year Support

\$2,999 Intel® 120MHz Pentium™ Processor

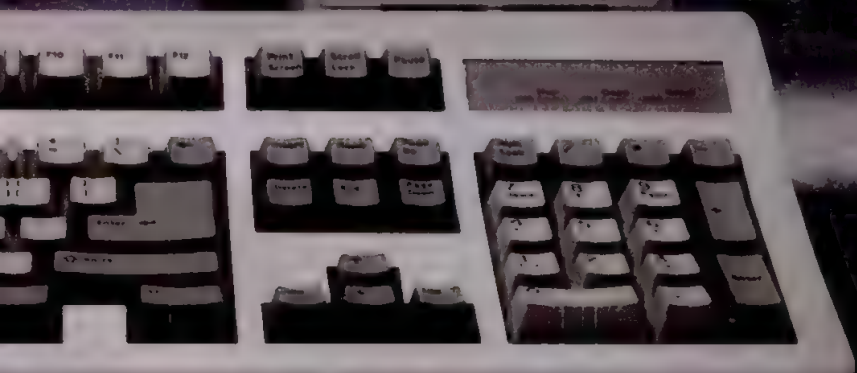
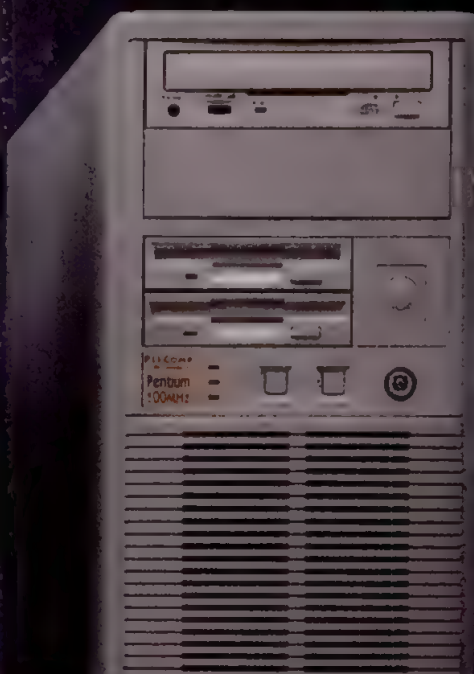
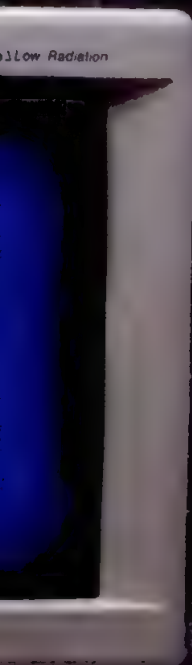
\$3,199 Intel® 133MHz Pentium™ Processor

ADVANTAGE

Monday - Friday
8:00 a.m. - 7:00 p.m.
Saturday
10:00 a.m. - 4:00 p.m.
(CDT)



No service charge for credit card orders. We are not responsible for errors in typography. Original shipping and handling fees, as well as return shipping charges, are non-refundable. There are no returns for credit after 30 days. Please call PerComp™ for an RMA number prior to returning any merchandise. Call or write for more information on warranties and deliveries. Call for latest pricing information. MASTERCARD, VISA, DISCOVER & AMERICAN EXPRESS ACCEPTED. All registered and unregistered trademarks are the sole property of their respective companies. The Intel Inside Logo, Intel and Pentium are registered trademarks of the Intel Corporation.



\$2,149

- Intel® 90MHz Pentium™ Processor
- 8MB RAM, 256Kb Cache
- 850MB Hard Drive
- PCI Fast IDE Interface
- Diamond Stealth II 1024x768 Video, 2MB VRAM
- QUAD Speed CD-ROM Drive
- Lotus SmartSuite 3.1
 - Lotus 123 & Ami Pro
 - Lotus Freelance Graphics
 - Lotus Approach & Organizer
- 16-bit Stereo Sound Card
- Premium Speaker System
- 14.4 Fax Modem
- 3.5" Floppy Disk Drive
- 15" SVGA .28dp, Digital Color Monitor
- Desktop or Mini Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- PerComp 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 & WFW 3.11
- 24-Hours 7-Days a week Hardware & Software Support
- "TRUE" 3 Year Support

\$2,299

Intel® 100MHz Pentium™ Processor

\$2,499

Intel® 120MHz Pentium™ Processor

\$3,199

- Intel® 100MHz Pentium™ Processor
- 16MB RAM, 256Kb Cache
- 1.2GB Hard Drive
- PCI Fast IDE Interface
- Diamond Stealth II 1024x768 Video, 2MB VRAM
- QUAD Speed CD-ROM Drive
- Lotus SmartSuite 3.1
 - Lotus 123 & Ami Pro
 - Lotus Freelance Graphics
 - Lotus Approach & Organizer
- WAVETABLE Stereo Sound Card
- Premium Speaker System
- 14.4 Fax Modem
- 3.5" Floppy Disk Drive
- 17" SVGA .28dp, Digital Color Monitor
- Desktop or Mini Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- PerComp 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 & WFW 3.11
- 24-Hours 7-Days a week Hardware & Software Support
- "TRUE" 3 Year Support

\$3,399

Intel® 120MHz Pentium™ Processor

\$3,599

Intel® 133MHz Pentium™ Processor

1-800-856-6688

Fax: 214-234-8658

CIRCLE 053 ON READER SERVICE CARD

making sure the vertical setting for the text box is relative to paragraph, so that the text box moves along with the table. (For details, see "Merging Cells Vertically in a WinWord 6.0 Table," November 8, 1994.)

To insert a WordArt object, first select the text box so you can see a blinking cursor inside the box. Choose Insert Object, then the Create New tab. In the Object Type list box, highlight Microsoft WordArt 2.0 and choose OK. When you insert a WordArt object, WordArt will open a dialog box labeled Enter Your Text Here, where you can enter the text you want to use. WordArt also replaces the WinWord toolbar with its own toolbar; the Shape pull-down menu is the leftmost item. You can pull down the menu and experiment with different shapes for the text. Each time you select a different shape, you'll see the result in the text box in your document.

		Third Quarter		Total Year to Date
		Widgets	Gadgets	Thingamabobs
West East	Widgets	343	1012	
	Gadgets	362	1123	
	Thingamabobs	324	986	
	Junk	248	786	
West East	Widgets	221	868	
	Gadgets	243	712	
	Thingamabobs	212	653	
	Junk	186	534	

Region	Third Quarter		Total Year to Date
Eastern	Widgets	343	1012
	Gadgets	362	1123
	Thingamabobs	324	986
	Junk	248	786
Western	Widgets	221	868
	Gadgets	243	712
	Thingamabobs	212	653
	Junk	186	534

Figure 2: Word for Windows can't merge cells vertically, but if you use text boxes to get the same effect, you can also use WordArt to print text vertically in those cells for a more professional look, as shown in the top table here. You can also use WordArt to add more interesting text effects, as in the bottom table. You can even insert graphics if you like.

If necessary, you can adjust the size of the text box by closing WordArt (just click anywhere on your document). The text box should be selected at this point, with a gray frame around it and small black rectangles to function as handles. If not, simply click anywhere on the box to select it. To adjust the size of the text box—and the object within it—move the mouse cursor over one of the handles until the cursor changes to a double-headed arrow, then click the left mouse button, drag the handle, and release it to indicate the new size.

To insert other kinds of objects, such as graphics, follow the same general procedure. After choosing Insert Object, then the Create New tab, simply highlight the appropriate item in the Object Type list box before choosing OK.

—M. David Stone

SPREADSHEETS

Getting Down with VBA

When I have multiple worksheet sections in a 1-2-3 or Quattro Pro file, I use a menu macro that goes to the top corner of the range, then down to the next entry with {end}{down}{down}. I can't seem to figure out how to do that in Excel 5.0 using Visual Basic, Applications Edition. Can you help?

Robert J. Gilson

Starnberg-Hanfeld, Germany

PC MAGAZINE: The following VBA statement is equivalent to pressing End-Down Arrow (or executing {end}{down} in a 1-2-3 macro):

```
Selection.End(xlDown).Select
```

You can use this to get to the end of the current block or the beginning of the next block. To mimic {end}{down}{down}, use Selection.End(xlDown).Select twice. To mimic End-Up Arrow, End-Right Arrow, or End-Left Arrow, use the following:

```
Selection.End(xlUp).Select
Selection.End(xlToRight).Select
Selection.End(xlToLeft).Select
```

You can also use these End constructions with range objects other than Selection. For example,

```
Range("A1").End(xlToRight).Select
```

would select the rightmost cell in row 1 of the block beginning at A1, assuming that A1 is not blank. The statement

```
Range("G1").Value=Range("A1").End(xlDown).Value
```

would copy into cell G1 the value of the last cell in column A of the block beginning with A1.—Craig Stinson

Printing Formulas In 1-2-3

I am trying to print out all the formulas in a Lotus 1-2-3 for Windows (Release 4.0) spreadsheet. I am able to do this in Lotus 1-2-3 for DOS (Release 3.4), but not in Windows. Is there a way?

Charles Miller

Flushing, New York

PC MAGAZINE: Yes, use the "classic" menu. In other words, just type the same keystrokes you used to use in Release 3.4: /PPOCG. As in Release 3.4, you must first specify the range whose formulas you want to print, and you have to use the Page command to eject the last page from the printer when 1-2-3 has finished printing.—Craig Stinson

DATABASES

Creating a Progress Thermometer in Access Basic

I'd like to use a progress thermometer routine in my Access Basic programs. Can you suggest a good one?

Jerry Schmidt

Orlando, Florida

PC MAGAZINE: Starting with Version 1.1 you can use Access's own "progress meter," the same one you see in the status bar when Access starts up. To use this, you call the SysCmd function first to initialize, then each time you update, and finally to remove the progress meter. For example, call SysCmd with the intrinsic constant SYSCMD_INITMETER, like this:

```
Rc=SysCmd(SYSCMD_INITMETER,
"Processing Records...", 100)
```

Access then creates the progress meter and displays the text in the second argument to the left of the meter.

The third argument supplies the maximum value for the meter. You'll need to think carefully about what value to use for the maximum value. You can use 100 to represent 100 percent and then update the meter periodically with some

Mr. Boddy has been murdered, and his killer escapes at large. But sometime today before the scheduled 8:00 p.m. reading of Mr. Boddy's last will and testament, the murderer will change the document to read in his or her favor.

Unfortunately Boddy's closest living relative, Mr. Green, is out of town on business and was not informed of his cousin's death. But those who have gathered at the Boddy mansion for the reading include Mrs. Peacock, the recent State-to-be Colonel Mustard, world-famous Medical Professor Plum, a decorated and classmate during his days at Yale, Miss Scarlet, a "special friend"; and Mrs. White, his loyal servant of 25 years.

Please help to find the killer by determining who changed the will, where... and with what...

MIDWEST MICRO



The Sound Book II With Convenience Is Served



Personality Modules...

THE REAL
3
YEAR
WARRANTY

7:45 p.m. and tensions are high. The anticipated reading of the will is only minutes away. But with so many unique personalities in one room, Midwest Micro's SoundBook II should feel right at home!

When the main course is murder, people tend to lose their appetite—but they still hunger for convenience. And that's where the NEW SoundBook II comes in. Featuring a programmable Personal TouchPad, two RAM compartments and a modular design, this Midwest Micro Notebook is dressed to kill. So before we interrogate the other suspects at the table, let's investigate the SoundBook II...

Powerful Features...Weak Alibi

Who *knows* where this portable was on the night in question? Weighing only 6 lbs., it could have gone *anywhere*! Some eyewitnesses claim they saw the SoundBook II with a built-in floppy drive at 6:37 p.m. While another source swears the same drive bay was carrying an AC adapter at precisely 6:40! What makes the SoundBook II such a master of disguise?—It uses special compact peripherals, A.K.A. Personality Modules, that fit its modular 3.5" drive bay. Enjoy the floppy drive and AC adapter modules that come with your SoundBook II. And feel free to order additional modules like a 3.5" CD-ROM drive, a 14.4 Kbps voicemail fax modem, an extra hard drive and an extra battery.

Evidence Stacked In Your Favor

If *speed* is your motive, you may want to check out Midwest Micro's Pentium® Processor Based SoundBook Plus. Like the SoundBook II, it comes with 16-bit stereo audio and built-in speakers. But this SoundBook *also* features a 75 MHz or 90 MHz Intel® Pentium Processor. And if you think *that* sounds like a setup, get a load of The Real Warranty. It covers all Midwest Micro Notebooks for a full three year sentence—parts *and* hard labor included! We can only assume that Mr. Boddy (being of sound mind) would have loved both Midwest Micro SoundBooks.

Contributing To The Delinquency Of A Diner?

Although it's unlikely that these Midwest Micro Notebooks are capable of murder, they *may* be found guilty of aiding and abetting. In fact, one of these guests *may* have already used a SoundBook to change Mr. Boddy's will. Perhaps Mrs. Peacock is doing it right now!—Or maybe she's just playing a little Microsoft® Golf.

Since we have a little time before Mr. Boddy's lawyer arrives, let's reconstruct another way this heinous crime may have been committed.

"Fastest portable we've ever tested, a fine desktop replacement"
—PC World, April 1995

"Midwest Micro wowed us with its Elite Pentium SoundBook Plus, the first Pentium-90 notebook we've tested; its performance blows every other reviewed mobile out of the water."
—PC World, March 1995

"...produced the highest Winstone 95 score of all reviewed systems"
—PC Magazine, January 1995



**MIDWEST
MICRO**

IT'S IN OUR NATURE

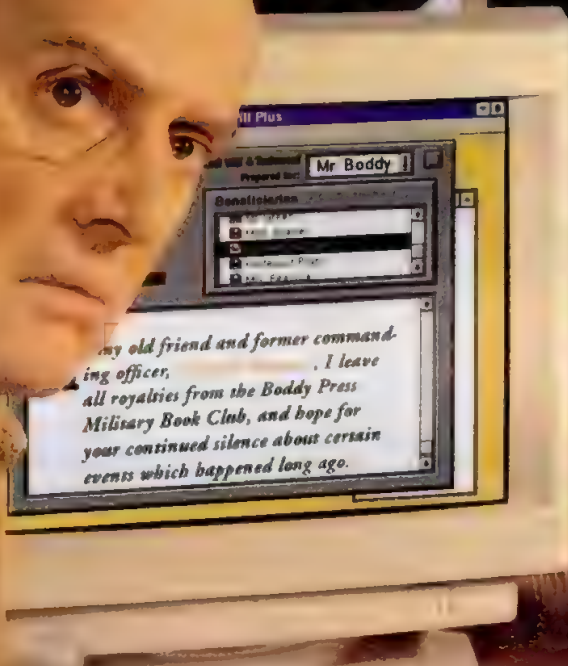
Systems

1-800-682-7256

Peripherals

1-800-445-2794

Colonel Mustard



In The Kitchen With A Midwest Micro PC?

"It's darn fast and darn cheap."
— PC Computing, April 1995

"The Elite P5-90 is one of the fastest computers we've tested."
— PC World, January 1995



"I can't believe these people didn't put lunch on the itinerary," the Colonel grumbled. "And you would think a person with this much money could afford better lunch meat." Was it merely hunger pains that brought Colonel Mustard into the kitchen this afternoon? Or was it Mr. Boddy's Midwest Micro Home PC... and revenge!...

Mustard hadn't touched a computer since his code cracking days in the Middle East. But this "Midwest Micro Home PC" looked nothing like *that* relic. Typing in the secret password with his one good hand, the Colonel checked his watch again. He knew exactly how long it would take the IntelDX4™ 100 Processor to find the will, make the changes and save them on the Home PC's 850 Mb hard drive. "Not bloody long at all," he said with a smirk.

Colonel Mustard had planned his strategy very carefully. And after reading six computer magazines cover-to-cover, he learned that Midwest Micro Desktop Systems are available with Intel486™ and Pentium® Processors, double- and quad-speed CD-ROM drives, voicemail fax modems and hard drive capacities up to 1.6 Gb! And whether you order a multimedia-packed Home PC or an Office PC stocked with powerful business software, you should always expect an ambush of high performance. But even nine weeks at boot camp, two wars and a Purple Heart didn't prepare the Colonel for what he was about to witness...

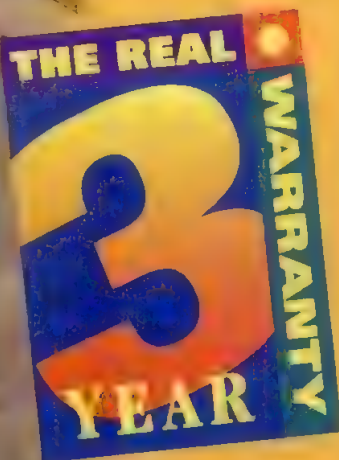
Opening the Home PC's Microsoft® Family Bundle, Mustard found an arsenal of interactive CD-ROM software—Encarta® 95, Works, Money, Scenes, Dangerous Creatures and Golf were his to conquer. Before he knew it, the 15" color screen had exploded into multimedia mutiny. And he was even *more* impressed with Microsoft Bob™. Featuring eight household management programs in one efficient package, this new recruit had all the makings of a great soldier.

By this time the Colonel was distracted from his original covert operation. So he set a course for the library to see what Mr. Boddy's 120 MHz Office PC had to offer...

Who killed Mr. Boddy and changed his will? The rest of the investigation is up to you...

To find out "who dun it" and receive a **FREE** catalog dial 1-800-204-0318.

Systems may also include:



**MIDWEST
MICRO**

IT'S IN OUR NATURE

Systems

1-800-682-7256

Peripherals

1-800-445-2794

MidWest Micro Home PCs

DX2-66 PCI

\$1599

- #009401
- Intel DX2™ 66 Processor
- 8 Mb RAM, 128 Kb Cache
- 545 Mb IDE Hard Drive
- PCI Local Bus Graphics with 1 Mb
- PCI Fast IDE Interface
- Quad-Speed CD-ROM Drive
- Microsoft® Bob™
- Microsoft Family Bundle — Encarta® 95, Works, Money, Scenes, Dangerous Creatures & Golf
- 16-Bit Stereo Sound Card
- Digital Quality Speakers
- 14.4 Fax Modem with Voicemail
- 3.5" Disk Drive
- 14" SVGA .28 N/1 Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS® 6.22 and WFW 3.11
- EPA Energy Star Compliant
- The Real 3 Year Warranty

P5-75 PCI

\$1999

- #009441
- Intel® 75 MHz Pentium® Processor
- 8 Mb High Performance EDO RAM
- 1 Gb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 1 Mb
- Quad-Speed CD-ROM Drive
- Microsoft Bob
- Microsoft Family Bundle — Encarta® 95, Works, Money, Scenes, Dangerous Creatures & Golf
- 16-Bit Stereo Sound Card
- Altec Lansing® Stereo Speakers
- 14.4 Fax Modem with Voicemail
- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- The Real 3 Year Warranty

P5-120 PCI

\$3299

- #008760
- Intel 120 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 1.2 Gb IDE Hard Drive
- PCI Fast IDE Interface
- ATI® MACH 64 PCI Accelerator with 2 Mb
- Quad-Speed CD-ROM Drive
- Microsoft Bob
- Microsoft Family Bundle — Encarta® 95, Works, Money, Scenes, Dangerous Creatures & Golf
- 16-Bit Wavetable Sound Card
- Altec Lansing Stereo Speakers with Subwoofer
- 14.4 Fax Modem with Voicemail
- 3.5" Disk Drive
- 17" .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- The Real 3 Year Warranty

P5-133 PCI

\$3999

- #009443
- Intel 133 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 1.6 Gb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Accelerator with 4 Mb VRAM
- Quad-Speed CD-ROM Drive
- Microsoft Bob
- Microsoft Family Bundle — Encarta® 95, Works, Money, Scenes, Dangerous Creatures & Golf
- 16-Bit Wavetable Sound Card
- Altec Lansing Stereo Speakers with Subwoofer
- 14.4 Fax Modem with Voicemail
- 3.5" Disk Drive
- 17" .26 1600 x 1200 ExactMatch Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- The Real 3 Year Warranty



MidWest Micro Office PCs

P5-75 PCI

\$2199

- #009406
- Intel 75 MHz Pentium Processor
- 16 Mb High Performance EDO RAM
- 1 Gb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 1 Mb
- Quad-Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Word 6.0, Bookshelf, Encarta 95, Works, Multimedia Edition 3.0 & Money 3.0
- The Real 3 Year Warranty

P5-100 PCI

\$2199

- #009408
- Intel 100 MHz Pentium Processor
- 8 Mb RAM, 256 Kb Cache
- 850 Mb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Local Bus Graphics with 1 Mb
- Quad-Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS® Office Professional, Bookshelf & Encarta 95
- The Real 3 Year Warranty

P5-100 PCI

\$2699

- #009409
- Intel 100 MHz Pentium Processor
- 16 Mb RAM, 256 Kb Cache
- 1.2 Gb IDE Hard Drive
- PCI Fast IDE Interface
- ATI MACH 64 PCI Accelerator with 2 Mb
- Quad-Speed CD-ROM Drive
- 3.5" Disk Drive
- 15" SVGA .28 Digital Color Monitor
- 8-Bay Mini-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Signature 101-Key Enhanced Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Office Professional, Bookshelf & Encarta 95
- The Real 3 Year Warranty

P5-133 PCI

\$4899

- #009449
- Intel 133 MHz Pentium Processor
- 32 Mb RAM, 256 Kb Cache
- 1.6 Gb IDE Hard Drive
- PCI Fast IDE Interface
- PCI Accelerator with 4 Mb VRAM
- Quad-Speed CD-ROM Drive
- 16-Bit Wavetable Sound Card
- Altec Lansing Stereo Speakers with Subwoofer
- 28.8 S/R Fax Modem
- 3.5" Disk Drive
- 17" .26 1600 x 1200 ExactMatch Color Monitor
- 10-Bay Full-Tower Case
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- Super I/O using 16550 UART & ECP/EPP
- Microsoft Natural Keyboard
- Microsoft Mouse
- MS-DOS 6.22 and WFW 3.11
- MS Office Professional, Bookshelf & Encarta 95
- The Real 3 Year Warranty

P5-75 PCI

\$1999

#009445

P5-90 PCI

\$2599

#009410

P5-100 PCI

\$4399

#008786

P5-120 PCI

\$4699

#008785



Customizing Your System

If you don't see a system configuration which meets your needs, we'll be glad to customize a system for you. Choose your own case design, amount of RAM, hard drive size and other add-ons such as modems and multimedia kits.

Ask your MidWest Micro Representative about our Windows® 95 upgrade.

MidWest Micro SoundBook Plus Based On Intel's Pentium® Processor

- ▶ Intel® Pentium® 90 or 75 MHz Processor
- ▶ 64-Bit, 256 Kb Synchronous Burst External Cache
- ▶ 64-Bit, 8 Mb RAM (expands to 40 Mb)
- ▶ 10.3" Dual-Scan or 10.2" Active-Matrix VGA Display
- ▶ PCI Local Bus Video with 1 Mb VRAM
- ▶ PCI Local Bus HDD Controller

- ▶ 16-Bit Stereo Audio (Sound Blaster & Windows® Sound System Compatible)
- ▶ Built-in Stereo Speakers & Microphone
- ▶ External Jacks for Line In & Line Out
- ▶ 3.5" Built-in Disk Drive
- ▶ User Replaceable Hard Drive
- ▶ Two Type II/One Type III PCMCIA Slots
- ▶ Integrated Pointing Device
- ▶ NiMH Battery & AC Adapter
- ▶ Advanced Power Management
- ▶ Bi-directional Parallel Port
- ▶ High Speed 16550 UART Serial Port
- ▶ Infra Red Wireless "IR" Interface
- ▶ External VGA & Keyboard/Mouse Port
- ▶ MS-DOS® 6.22 & WFW 3.11
- ▶ Microsoft® Works for Windows 3.0 & Golf
- ▶ Lotus® Organizer 2.0
- ▶ Weight: 6.8 lbs.
- ▶ Carrying Case
- ▶ The Real 3 Year Warranty



Dual-Scan Color

P5-75 with 340 Mb HDD	#008090	\$2599
P5-90 with 520 Mb HDD	#008025	\$2999
P5-90 with 720 Mb HDD, 16 Mb of RAM & PCMCIA 14.4 Fax Modem	#008101	\$3499

Active-Matrix Color

P5-75 with 340 Mb HDD	#008091	\$3599
P5-90 with 520 Mb HDD & 16 Mb of RAM	#008027	\$4299
P5-90 with 720 Mb HDD, 16 Mb of RAM & PCMCIA 14.4 Fax Modem	#008102	\$4499
P5-90 with 720 Mb HDD, 32 Mb of RAM & PCMCIA 28.8 Fax Modem	#008150	\$5299

Options

8 Mb RAM Card	#002558	\$379
16 Mb RAM Card	#002559	\$769
PCMCIA 14.4 Fax Modem	#002624	\$129
PCMCIA 28.8 Fax Modem	#005993	\$219
PCMCIA Combo Ethernet Adapter	#001954	\$139
PCMCIA Panasonic Double-Speed CD-ROM Drive	#003728	\$295
Leather Carrying Case	#001515	\$ 99

MidWest Micro SoundBook II

- ▶ IntelDX4™ Processor with SMM Support
- ▶ Modular Design with Personality Modules
- ▶ 4 Mb RAM (expands to 36 Mb)
- ▶ 10.3" Dual-Scan or 10.2" Active-Matrix VGA Display
- ▶ Local Bus Video with 1 Mb
- ▶ 16 Bit Stereo Audio (Sound Blaster & Windows Sound System Compatible)
- ▶ 3.5" Floppy Disk Drive
- ▶ Two Type II/One Type III PCMCIA Slots
- ▶ Personal TouchPad Integrated Pointing Device
- ▶ NiMH Battery & AC Adapter
- ▶ Advanced Power Management
- ▶ One Parallel & One Serial Port
- ▶ External VGA & Keyboard Port
- ▶ MS-DOS 6.22 & WFW 3.11
- ▶ Microsoft Works for Windows 3.0 & Golf
- ▶ Lotus Organizer 2.0
- ▶ Weight: 6.0 lbs.
- ▶ Carrying Case
- ▶ The Real 3 Year Warranty

Dual-Scan Color

DX4-75 with 340 Mb HDD	#008141	\$1999
DX4-75 with 520 Mb HDD & 8 Mb of RAM	#008106	\$2299
DX4-100 with 520 Mb HDD & 8 Mb of RAM	#008142	\$2399
DX4-100 with 720 Mb HDD & 8 Mb of RAM	#008108	\$2499
DX4-100 with 720 Mb HDD, 16 Mb of RAM & PCMCIA 14.4 S/R Fax Modem	#008109	\$2999

Active-Matrix Color

DX4-75 with 520 Mb HDD & 8 Mb of RAM	#008111	\$3099
DX4-100 with 520 Mb HDD & 16 Mb of RAM	#008112	\$3599
DX4-100 with 720 Mb HDD, 16 Mb of RAM & PCMCIA 28.8 Fax Modem	#008151	\$3899



Options

Personality Modules		
- AC Adapter	#004794	\$ 79
- Battery	Call	Call
- 3.5" CD-ROM Drive	#004797	\$429
- 14.4 Fax Modem with Voicemail	#004793	\$145
- SCSI Adapter	#005561	\$ 85
4 Mb RAM Card	#006381	\$199
8 Mb RAM Card	#002558	\$379
16 Mb RAM Card	#002559	\$769
128K Cache Upgrade	#004796	\$ 69
Altec Lansing® ACS51 Speakers	#006712	\$ 69
HP Deskjet 320 Printer	#004915	\$309
PCMCIA 14.4 Fax Modem	#002624	\$129
PCMCIA 28.8 Fax Modem	#005993	\$219
PCMCIA Combo Ethernet Adapter	#001954	\$139
PCMCIA Panasonic Double-Speed CD-ROM Drive	#003728	\$295
Leather Carrying Case	#001515	\$ 99

* Ask your MidWest Micro sales representative about additional hard drive, screen and processor options.

Disclaimer: Intel, the Intel Inside logo, Intel486, IntelDX2, IntelDX4 and Pentium are trademarks and registered trademarks of Intel Corporation. Microsoft, MS, MS-DOS, Bookshelf, Encarta, Windows and the Windows logo, Bob and the Bob logo are trademarks and registered trademarks of Microsoft Corporation. The Energy Star emblem does not represent EPA endorsement of any product or service. All products are trademarks of their respective manufacturers. All registered and unregistered trademarks are the sole property of their respective companies.

Policy: No service charge for credit card orders. Prices are subject to change. Repair or replacement of defective products is at MidWest Micro's discretion. We are not responsible for errors in typography and photography. Original shipping and handling fees, as well as return shipping charges, are non-refundable. There are no returns for credit after 30 days. All returns must be shipped in original packaging. Call or write MidWest Micro for more information on warranties and policies.



6910 U.S. Route 36 East, Fletcher, Ohio 45326

1-800-682-7256

Fax: 1-800-562-6622

Monday-Friday: 9 a.m. to 7 p.m. Saturday: 10 a.m. to 4 p.m.



For your protection we check thoroughly for stolen credit cards.

Technical Support:

1-800-262-6622

Customer Service:

1-800-728-8584

Dealers Call:

1-800-682-0522

infoFax:

1-800-445-2025

AD#G08


```
' Function TryMeter
' Demonstrates how to use the Access progress meter
Function TryMeter ()
Dim MyDb As Database, MyTable As Table
Dim RecCount As Integer, Rc As Variant, X As Integer
Set MyDb = CurrentDB()
Set MyTable = MyDb.OpenTable("Customers")
MyTable.MoveLast
RecCount = MyTable.RecordCount
MyTable.MoveFirst
Rc = SysCmd(SYSCMD_INITMETER, "Processing Customers...", RecCount)
For X = 1 To RecCount
    ' Process the record here
    Rc = SysCmd(SYSCMD_UPDATESMETER, X)
    MyTable.MoveNext
Next X
Rc = SysCmd(SYSCMD_REMOVEMETER)
End Function
```



Figure 3: The TryMeter function demonstrates how to use Access's Progress Meter in your own programs.

value representing a completion percentage less than or equal to 100 percent. Or you can set the maximum to some number meaningful to the operation being performed, such as the total number of records being processed, and then update the meter periodically with the number of records that have been processed thus far.

Whatever value you supply, Access uses it to calculate the percentage and to display it on the progress meter. For instance, if you supply a maximum value of 1,000 and then update the meter with 250, the meter will be one quarter filled. To decide what value to use for the maximum, you need to determine where you'll get the values used to update the progress meter.

To update the meter, you use:

```
Rc=SysCmd(SYSCMD_UPDATESMETER,
Amount)
```

where Amount is some value less than or equal to the maximum. Access uses the maximum value you supplied when you initialized the meter along with the value you supply here to determine how much of the progress bar to fill.

To clear and remove the meter, use:

```
Rc=SysCmd(SYSCMD_REMOVEMETER)
```

The SysCmd function is documented in the Help file for Version 2.0 and has a number of other uses.

Figure 3 shows a sample function that illustrates how to use the progress meter. To try it, first open the NWIND.MDB

sample database that comes with Access. Then select Modules, select the Utility functions module, and choose Design. Next, click the New Procedure button on the Toolbar. When Access asks for the procedure name, type in the name of the function, TryMeter, and then choose OK. Now enter the function as shown in Figure 3. Then select the View menu and choose Immediate Window. Finally, enter the following command into the Immediate window:

```
? TryMeter()
```

You'll see the progress meter appear in the status bar.

The TryMeter function is available on ZiffNet. Look for the file TRYMET.AB.—*Sal Ricciardi*

■ GRAPHICS Typography 101

Ⓢ As the printout in Figure 4 shows, I've got a problem using PageMaker 5.0 with my PostScript printer. When I italicize a word in a "loose" line, the word and letter spacing gets distorted: There is an extra-long space before the italic word, and the spacing in other words is compressed.

The problem seems to be a by-product

Many bird species breed in the North Atlantic including Gannet *Morus bassanus* and other seabirds.

Figure 4: Irregular word spacing in PageMaker 5.0 is caused by a combination of formatting attributes, including a narrow column width, large point size, and justified alignment.

uct of the selection process. Whenever you highlight a word with a double-click, the space after (but not the space before) the word is also selected. Thus, the space after the selected word is italicized, while the space before the word remains normal.

I typically solve the problem by manually selecting the word space before the italic word and changing its attribute from normal to italic. I also frequently have to add filler words to tighten the line and so improve the word spacing. But can you provide a less laborious solution?

*Gunniaugur Pétursson
Reykjavik, Iceland*

► **PC MAGAZINE:** I could easily produce the loose lines—lines in which the word spacing creates unsightly gaps in the copy—using your sample text. Basically, your design decisions have combined to produce the worst of all possible worlds for PageMaker's type composition engine. You've selected a narrow column width, used a fairly large point size, and applied justified alignment. In order for PageMaker to get the left and right margins of the text to align, it must add space somewhere. The default spacing settings (found under the Type | Paragraph | Spacing menu) favor an increase in word spacing over an increase in letter spacing.

You can achieve more pleasing spacing by taking advantage of PageMaker's sophisticated typographic controls. For the biggest payback with the least effort, you should employ PageMaker's powerful hyphenation routines. This means that you should add unusual words, such as the Latin genus *Morus bassanus*, along with their recommended hyphenation breaks to the dictionary. Then make sure that PageMaker is set to use the dictionary by selecting the Manual Plus Dictionary option in the Hyphenation dialog box. (This is accessible from the Type menu.) Once PageMaker knows how to hyphenate these words, it will do so to fix loose lines. In your example, hyphenating *bassanus* would solve the problem.

An even easier solution would be to change the *tracking value*, which algorithmically adjusts word and letter spacing on the basis of the selected text's

GREAT PRODUCTS. PRICELESS SUPPORT!

2GB OF SUPER FAST STORAGE! ONLY \$899.95



APS MS 2.0

- ✓ Fastest 2GB drive available
- ✓ Unmatched combination of reliability and performance
- ✓ 5-year warranty



MobilStor™ Tape850

- ✓ 850MB capacity
- ✓ Simple to use—attaches to your parallel port quickly and effortlessly
- ✓ DOS and Windows™ backup software included

Just **\$349.95**



APS DAT2

- ✓ 4GB+ native capacity
- ✓ Uses 60, 90 or 120-meter DAT tapes
- ✓ 2-year warranty

\$799.95

External configuration

APS SCSI ADAPTER CARDS

CARD MODEL	PC BUS CONNECTION	FLOPPY CONTROLLER INCLUDED	EXTERNAL SCSI CONNECTION	PRICE
ADAPTEC[®] 1542CF	ISA (AT)	YES	CENTRONICS 50 PIN	\$239⁹⁵
2940	PCI	NO	MICROSCSI 50 PIN	289⁹⁵
BUS LOGIC 540CF	ISA (AT)	NO	CENTRONICS 50 PIN	\$199⁹⁵
747C	EISA	YES	MICROSCSI 50 PIN	349⁹⁵

*Each Adaptec adapter card includes EZ SCSI DOS/Windows software for playing audio CDs, viewing photoCD images, backing up and restoring files and more. *With drive purchase.



APS MEDIA			
DAT TAPE MEDIA	1-4	5-9	10+
60-Meter	\$7 ⁹⁵	\$6 ⁹⁵	\$5 ⁹⁵
90-Meter	9 ⁹⁵	8 ⁹⁵	7 ⁹⁵
120-Meter	19 ⁹⁵	18 ⁹⁵	17 ⁹⁵
DAT Head Cleaner	11 ⁹⁵	10 ⁹⁵	9 ⁹⁵
DLT TAPE MEDIA	1-4	5-9	10+
DLT20 Data Cartridge	\$45 ⁹⁵	—	—
DLT40 Data Cartridge	109 ⁹⁵	—	—
DLT20 3-pack	119 ⁹⁵	—	—
DLT40 3-pack	299 ⁹⁵	—	—

SYQUEST MEDIA			
	1-4	5-9	10+
270MB Cartridge	\$64 ⁹⁵	\$63 ⁹⁵	\$61 ⁹⁵
DC-2000 MEDIA	1-4	5-19	20+
DC-2120 Single	\$12 ⁹⁵	\$10 ⁹⁵	\$9 ⁹⁵
DC-2120 3-Pack	31 ⁹⁵	—	—
3010XLF (BS08M)	26 ⁹⁵	24 ⁹⁵	23 ⁹⁵
3080XLF (HyperTape)	34 ⁹⁵	32 ⁹⁵	31 ⁹⁵
Mini Cartridge Cleaning Kit	19 ⁹⁵	18 ⁹⁵	17 ⁹⁵

(For MobilStor Tape250/850 and APS HyperTape drives)

Visit our Web Page at <http://www.apstech.com/>

Some day shipping for personal checks (Restrictions apply)



Visa, MasterCard, Discover, American Express (No Surcharge)

800 947-8125

InfoFax: (800) 374-5802

APS Technologies • 631 Decima • Great City, MO • 64120 30-day money-back guarantee. Your risk is the cost of shipping. Prices and specifications subject to change without notice. Refund orders subject to restocking fee. International customers must pay for all shipping costs. Some day shipping for personal checks (Restrictions apply). Corporate POs accepted upon approval. MobilStor and One-Step are trademarks of APS. All other names are trademarks or registered trademarks of their respective owners. *Novel makes no warranties with respect to this product. Developer tested only. *Maximum capacity using 2:1 data compression. Actual capacity may vary. All drive specifications come from in-house testing on a RISC-based computer. Your results may vary.

CIRCLE 052 ON READER SERVICE CARD

APS SCSI DRIVES

DRIVE	FORMATTED CAPACITY	DRIVE PRICE	EXTERNAL
APS Q 540 ³ Quantum	516MB	\$199 ⁹⁵	\$299 ⁹⁵
APS Q 730 ² Quantum	699MB	229 ⁹⁵	329 ⁹⁵
APS Q 840 ³ Quantum	811MB	299 ⁹⁵	399 ⁹⁵
APS Q 1080 ³ Quantum	1042MB	399 ⁹⁵	499 ⁹⁵
APS ST 1.0 ⁵ Seagate	1010MB	549 ⁹⁵	649 ⁹⁵
APS Q 1.0 ⁵ Quantum	1025MB	699 ⁹⁵	799 ⁹⁵
APS Q 2.0 ⁵ Quantum	2050MB	999 ⁹⁵	1099 ⁹⁵
APS MS 2.0 ⁵ Micropolis	1955MB	899 ⁹⁵	999 ⁹⁵
APS ST 2.0 ⁵ Seagate	2047MB	999 ⁹⁵	1099 ⁹⁵
APS MS 4.0 ⁵ Micropolis	4095MB	1399 ⁹⁵	1499 ⁹⁵
APS ST 4.0 ⁵ Seagate	4094MB	1499 ⁹⁵	1599 ⁹⁵
APS Q 4.0 ⁵ Quantum	4101MB	1499 ⁹⁵	1599 ⁹⁵
APS MS 9.0 ⁵ Micropolis	8649MB	2299 ⁹⁵	2499 ⁹⁵
APS ST 9.0 ⁵ Seagate	8649MB	2699 ⁹⁵	2899 ⁹⁵

APS SCSI CD-ROM DRIVES

DRIVE	EXTERNAL
APS T 3601 ¹ Quick-Speed	\$349 ⁹⁵

APS SCSI TAPE DRIVES

DRIVE	CAPACITY	DRIVE PRICE	EXTERNAL
APS HyperTape ²	2-4GB†	—	\$499 ⁹⁵
APS DAT2 ²	4GB	\$749 ⁹⁵	799 ⁹⁵
APS HyperDAT ²	8GB†	949 ⁹⁵	999 ⁹⁵
APS DLT20 ²	20GB†	—	3999 ⁹⁵
APS DLT40 ²	40GB†	—	5499 ⁹⁵

† 2:1 Software data compression ‡ 2:1 Hardware data compression

APS SCSI MO DRIVES

DRIVE	FORMATTED CAPACITY	EXTERNAL
APS 230 MO ² Olympus	217MB	\$599 ⁹⁵
APS 1.3 MO ² Sony	1244MB New 4MB cache	1999 ⁹⁵

15 Denotes length of manufacturer's warranty.

APS PARALLEL PORT DRIVES

DRIVE	CAPACITY	EXTERNAL
MobilStor Tape850 ²	850MB*	\$349 ⁹⁵
MobilStor Tape250 ¹	250MB* ^{With Supplies Local}	129 ⁹⁵
MobilStor 340 ^{1††}	340MB	399 ⁹⁵
MobilStor 520 ^{1††}	520MB	599 ⁹⁵
MobilStor SyQuest 270 ¹	270MB	499 ⁹⁵
MobilStor CD ¹	Double Speed	249 ⁹⁵

†† Includes NICAD battery

MOBILSTOR EXTRAS

Drive Carrying Case	\$34 ⁹⁵
DataSaver Kit	3-pack DC-2120 tapes & cleaning kit 45 ⁹⁵



IBM NEC SHARP ZENITH TOSHIBA EPSON hp HEWLETT PACKARD

Florida's Largest Authorized Dealer For Notebook Computers

Price Availability Delivery

YOUR DIRECT SOURCE



ALL MODELS IN STOCK



CASHING BEST PRICE!



WE WILL MEET OR BEAT ANY LEGITIMATE PRICE!

IBM

CALL FOR POWER PC THINKPAD

THINKPAD 701

701CS DUAL DX50 4/360	\$3199
701CS DUAL DX50 4/540	\$3499
701CS DUAL DX50 8/360	\$3699
701CS DUAL DX50 8/540	\$3999
701C Active DX50 4/360	\$3099
701C Active DX50 4/540	\$3399
701C Active DX50 8/360	\$3499
701C Active DX50 8/540	\$3799

THINKPAD 755

NEW PENTIUMS

755CX DX75 Pentium 8/540 Active	CALL
755CX DX75 Pentium 8/810 Active	CALL
CE DX Active 100 8/340	\$4999
CE DX Active 100 8/540	\$5149
CE DX Active 100 8/810	\$5499
CSF DX DL AL 100 8/340	\$4999
CSF DX DL AL 100 8/540	\$4449
CSF DX DL AL 100 8/810	\$4899
CD DX Active 100 8/540	CALL
CD DX Active 100 8/810	CALL

CALL FOR 300 SERIES

TEXAS INSTRUMENTS

MULTIMEDIA TRAVELMATE™ 5000M

TMS5000M Pent. DX4/75 8/524 Dual	CALL
TMS5000M Pent. DX4/75 8/810 Active	CALL

MULTIMEDIA TRAVELMATE™ 4000M

DX2/50 4/340 Dual	\$1899
DX2/50 4/455 Active	\$2145
DX4/75 4/340 Active	\$2145
DX4/75 4/455 Dual	\$2145
DX4/75 4/455 Active	\$2395
DX4/100 4/524 Active	\$3195

SMART Modem Technology, Inc.

ST 1414C1 Fax Modem (For Cellular) **CALL**

28.8 Kbps V34/Vistafax Fax Modem **CALL**

ST 1414L Fax & Voice **CALL**

Megahertz

Call For Latest Prices!

PCMCIA Ethernet Modems **CALL**

28,000bps PCMCIA modems (XJ2288 & CC3288) **CALL**

The XJACK® PCMCIA connectors **CALL**

EPSON

• 866C DX66 4/340 Dual	\$2259
• 880C DX80 8/340 Dual	\$2390
• 880CX DX80 8/340 Active	\$3889
• 660C 486 DX2/66 4/340 Dual	\$1809
• 660CX 486 DX2/66 8/340 Active	\$2870

STYLUS COLOR BEST BUY

• ACTION LASER 1100	\$175
• ACTION LASER 1400	\$465
• LX 300	\$169
• LQ 300	\$179
• LQ 570+	\$250
• LQ 870 24 pin	\$430
• LQ 1170+ 24 pin	\$398
• FX 870 9 pin	\$295
• FX 1170	\$285
• DFX 5000+	\$1495
• DFX 8000	\$2515

NEC

NEC VERSA V

• Versa V 486 DX2/50 4/250 4/340 Dual	\$2089/\$2135
• Versa V 486 DX2/50 4/250 4/440 Active	\$2325/\$2319/\$2595
• Versa V 486 DX4/75 4/340 4/540 Active	\$2505/\$2690
• Versa V DX50 4/340 10.1 Active	NEW \$2505
• Versa V DX75 4/540 10.1 Active	NEW \$2875

NEC VERSA P

• Versa P75C 75MHz 340MB 9.5 Active	\$3989
• Versa P75C 75MHz 540MB 9.5 Active	\$4269
• Versa P75C 75MHz 810MB 9.5 Active	\$4639
• Versa P75C 75MHz 540MB 10.4 Active	\$4545
• Versa P75C 75MHz 810MB 10.4 Active	\$4919
• Versa P75HC 75MHz 540MB High Res	\$4455
• Versa P75HC 75MHz 810MB High Res 9.5"	\$4825
• Versa P75HC 75MHz 810MB High Res 10.4"	\$5105

NEC VERSA M

• Versa M75D 75MHz 8/250 8/340	\$2319/\$2415
• Versa M75C 75MHz 8/340 8/540	\$2689/\$2969
• Versa M75CP 75MHz 8/340 *PEN	\$3339
• Versa M100C 100MHz 8/340 8/810	\$3339/\$3989
• Versa M75TC 75MHz 8/340	\$2690
• Versa M100TC 100MHz 8/340	\$3339
• Versa M75HC 75MHz 8/540	\$3155
• Versa M100HC 100MHz 8/540 8/810	\$3005/\$4175

CALL FOR VERSA S

• Versa 2000 DX4/75 8/350 Dual	CALL
• Versa 2000 DX4/75 8/350 8/540 Active	CALL

TOSHIBA

AUTHORIZED DEALER

NEW Call For T2110 & T2130 Series

• T2100 DX2/50 4/260 Mono	\$1399
• T2100CS DX2/50 4/350 Dual	\$1990
• T2100CT DX2/50 8/350 Dual	\$2689
• T2150CDS DX4/75 4/500 W/C/D ROM Dual	\$3075
• T2150CDT DX4/75 8/500 W/C/D ROM Act	\$3679

RAISECITY 4500GT

• T4800CT DX4/75 8/510 Active Color	\$3120
• T4850CT DX4/75 8/510 Active Color	\$3290
• T4850CT DX4/75 8/810 Active	\$3465
• T4850CT DX4/75 8/810 Mobile Pent.	\$4755

Satellite Pro T2400C & T2450CT SERIES

• T2400CS 486DX2/50 4/250 DUAL	\$2040
• T2400CS 486DX2/50 4/320 DUAL	\$2170
• T2400CT 486DX2/50 8/250 ACTIVE	\$2545
• T2400CT 486DX2/50 8/320 ACTIVE	\$2725
• T2450CT 486DX4/75 8/320	\$3120
• T2450CT 486DX4/75 8/500	\$3205

NEW T810CT 80MHz Pentium, 8/729 Active Call for Price

T3600CT Portage Series

• T3600CT 8/500	\$3205
-----------------	--------

OKIDATA

CALL FOR NEW OKIDATA 2010

LED PAGE PRINTERS MODELS:

OL400e 4 ppm 62410401	\$399
OL410e 4 ppm 62410701	\$525
OL410eP5 4 ppm 62410801	\$735
OL810e 8ppm	\$885
OL830+ 8 ppm 62410201	\$1059
OL850+ 8 ppm 62410301	\$1179
OL1200 12ppm	CALL

9-Pin Dot Matrix Printers

ML 320 (240x216 dpi max.) 62406101	\$295
ML 321 (240x216 dpi max.) 62406301	\$410
ML 320 (288x144 dpi max.) 62409201	\$355
ML 321 (288x144 dpi max.) 62410001	\$460
ML 184 TURBO (240x216 dpi max.) 62409801	\$399
PACEMARK 3410 (240x216 dpi max.) 61800801	\$1179



ZipNotebook Bundles

Package 1: Intel DX2/50, 4/200, Active, Megahertz PCMCIA 14.4 X-Jack Modem. Software includes: PC Tools for Windows, CommWorks for Windows, & CoSession Remote Software are **\$1939**

Package 2: Intel DX2/50, 8/340, Active, Megahertz PCMCIA 14.4 X-Jack Modem. Software includes: MS Office pre-installed, PC Tools for Windows, CommWorks for Windows, & CoSession Remote Software **\$2205**

Package 3: Intel DX4/75, 8/520, Active, Megahertz PCMCIA 14.4 X-Jack Modem. Software includes: MS Office pre-installed, PC Tools for Windows, CommWorks for Windows, & CoSession Remote Software **\$2755**

• Z-STAR EX 486DX2/50MHz, 4/200, 8/200 MONO	\$1335/\$1795
• Z-STAR EX 486DX2/50MHz, 4/200, 8/340 DUAL	\$1740/\$2285
• Z-STAR EX 486DX2/50MHz, 4/340, 8/340 ACTIVE	\$2710/\$2985

Z-Power Portable CD-ROM Presentation Unit

- Double Speed CD ROM
- 300MB/sec. data transfer
- On Board Speakers W/16-bit stereo sound
- PCMCIA Card and Cable
- Audio Input/Output Jacks
- Bulk-In Microphone

\$469

AST

ASCENTIA AUTHORIZED DEALER

• 950 N Pentium 75 8/500 DUAL	\$3245
• 950 N Pentium 75 8/800 DUAL	\$3525
• 950 N Pentium 75 8/1.2 GB DUAL	\$3985
• 950 N Pentium 75 8/800 ACTIVE	\$4635
• 950 N Pentium 75 8/1.2 GB ACTIVE	\$5055
• 810 N 486DX 66, 4/250 DUAL	\$1855
• 810 N 486DX 66, 4/340 DUAL	\$2055
• 810 N 486DX 66, 4/510 DUAL	\$2130
• 910 N 486DX 50, 8/340 DUAL	\$2409
• 910 N 486DX 75, 8/510 DUAL	\$2595
• 910 N 486DX 75, 8/700 DUAL	\$2875
• 910 N 486DX 75, 8/510 ACTIVE	\$3615
• 910 N 486DX 75, 8/700 ACTIVE	\$3895

SHARP

SHARP PC-3010

486DX66, 4/320, 10.4" DUAL	\$1769
----------------------------	--------

SHARP PC-3050

486DX66, 8/500, 10.4 DUAL	\$2325
---------------------------	--------

SHARP PC-8800

486DX75, 4/320, 10.4 SUPER VGA	\$2599
-------------------------------------	--------



CALL FOR JX-330 SCANNER

HIGH END NETWORK SERVERS

NEC AST IBM ZENITH

ALL MAJOR BRANDS AVAILABLE - CALL FOR BEST PRICE

AST Manhattan G Models	CALL
AST Manhattan V Models	CALL
AST Manhattan P Models	CALL
AST Manhattan SMP Models	CALL
NEC RISC, 150MHz, SMP, 64RAM, 1GB	CALL

OVERNIGHT DELIVERY AVAILABLE

hp HEWLETT PACKARD

Authorized Dealer

We Carry a Full Line of NEW Hewlett Packard Printers

• HP LaserJet 4L Printer	\$495
• HP LaserJet 4 Plus Printer	\$1405
• HP LaserJet 5P Printer	\$1849
• HP LaserJet 5M Printer	\$995
• HP Deskjet 320 Printer	\$289
• HP Deskjet 540 Printer	\$279
• HP Deskjet 600C Printer	NEW \$111
• HP Deskjet 1200C Printer	\$955
• HP Deskjet 1200CPS Printer	\$1539
• HP Scanjet 3p	\$455
• HP Scanjet 3c	\$899
• HP OfficeJet, Printer, Fax & Copier	\$725

• HP 200LX 1MB	\$485
• HP 200LX 2MB	\$605
• HP 5000CT 90 MHz 8/1.0 Gb VGA	CALL
• HP 5000CTS 90 MHz 16/1.0 Gb SVGA	CALL
• HP 600C DX 2/50, 4/170	\$2339
• HP 600C DX 2/50, 4/260	\$2469
• HP 600C DX 2/75, 8/170	\$2779
• HP 600C DX 4/75, 8/260	\$2959
• HP 4000C 486 DX2/50 4/260 Dual	\$2295
• HP 4000C 486 DX2/50 8/340 Dual	\$2470
• HP 4000C 486 DX2/50 8/520 Dual	\$2735
• HP 4000C 486 DX2/50 8/340 Active	\$2645

• HP 4000CT 486 DX2/50 8/520 Active	\$2869
• HP 4000CT 486 DX4/75 8/340 Active	\$2869
• HP 4000CT 486 DX4/75 8/520 Active	\$3045
• HP 4000CT 486 DX4/100 8/810 Active	\$3350
• HP 4000C 486 DX4/100 8/340 Dual	\$2909
• HP 4000C 486 DX4/100 8/520 Dual	\$3155
• HP 4000C 486 DX4/100 8/810 Dual	\$3450
• HP 4000CT 486 DX4/100 8/340 Active	\$3315
• HP 4000CT 486 DX4/100 8/520 Active	\$3509
• HP 4000CT 486 DX4/100 8/810 Active	\$3790
• HP 4000CT 486 DX4/100 16/810 Active	\$4350



SUNSHINE COMPUTERS

A Division Of INNOVATION COMPUTERS

1-800-413-5854

WHEN IN FLORIDA VISIT OUR 5000 SQ.FT. SHOWROOM

A Division of Innovation Computers

22191 POWERLINE RD., SUITE 14B, BOCA RATON, FL 33433

FOR TECH SUPPORT & CUSTOMER SERVICE: (407) 394-3742

FAX YOUR ORDER: (407) 750-4261

OUTSIDE USA: (407) 394-4180 • INTERNET: sergio@gate.net

Attention: Due To On-Going Price Updates of Notebook & Laptop Computers... CALL For Current Pricing and Availability

HOURS: MON-FRI 7AM TO 5PM E.S.T. • SAT: 10AM - 6PM E.S.T. • SUN: 12-5PM E.S.T.

• WE ACCEPT VISA, MASTERCARD, DISCOVER & AMERICAN EXPRESS

• NO CREDIT CARD SURCHARGE

TECH HOURS: MON-FRI 9-6 • SAT: 10-4

THE FOLLOWING ALSO APPLY:
• All items carry at least a one year warranty - 15 day return policy - All items returned must include original packaging and documentation
• No returns without RMA number - Shipping and handling are non-refundable - All returns are subject to re-checking by
• Not responsible for typographical or printing errors - Software is not returnable - Printers are not returnable

Sys Technology ... The Performance Leader!

SYS PERFORMANCE P120T:

- Intel™ 120MHz Pentium™ processor, Intel Triton™ chip set
- 256K fast write-back cache RAM, max 512K
- Integrated (2) high-speed serial & (1) ECP/EPP parallel
- Teac™ combo SuperQuad™ 4X CD-ROM with 3.5" floppy drive
- 16-bit stereo sound card/CD-ROM interface
- ATI™ mach64™ PCI video card with 2MB (OEM) or as noted
- 101-key enhanced keyboard; Microsoft™ serial mouse (OEM)
- Tower case with pull-out motherboard and card cage tray
- MS-DOS™ 6.22 and Windows for Workgroups™ 3.11 (or Windows® 95, when available)

STAGE 1:

- 8MB fast page mode DRAM, max 128MB
- 850MB enhanced IDE hard drive
- 15" flat screen SVGA monitor with .28dp and 1280x1024 resolution

\$2695

STAGE 2:

- 16MB fast page mode DRAM, max 128MB
- 1.2GB enhanced IDE hard drive
- 15" flat screen SVGA monitor with .28dp and 1280x1024 resolution

\$3095

STAGE 3:

- 16MB fast page mode DRAM, max 128MB
- 256K burst or pipelined, burst cache RAM
- 1.2GB enhanced IDE hard drive
- Diamond Stealth 64 Video VRAM video card, 2MB (OEM)
- 17" flat screen SVGA monitor with .26dp and 1280x1024 resolution

\$3595

With Pentium 75MHz processor	deduct	\$475
With Pentium 90MHz processor	deduct	\$375
With Pentium 100MHz processor	deduct	\$275
With Pentium 133MHz processor		\$Call

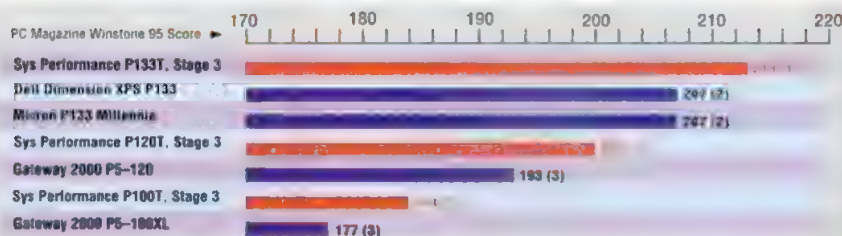
Customization - We're your custom configuration headquarters. The listed configurations are only samples of the many configurations which are available. Some of your options include--OS/2 Warp™, MS-Windows NT™ Workstation, EDO DRAM, network interface cards, tape and magneto-optical drives, fax/modems, PC Card reader/writers, and various component upgrades. Please call or fax for quotes.



Warranty—3 years limited parts and labor, lifetime technical support, on-site available.



September 27, 1994
Sys Performance
Pentium 90 Full Tower



■ (1) Based on in-house testing, an average of three passes. (2) PC Magazine article, July, 1995. (3) PC Magazine article, May 30, 1995



Sys Technology, Inc.

HIGH TECH ON YOUR SIDE

(800) 613-9963 Sales Only

(714) 821-3900 Fax: (714) 821-9592

6481 Global Drive, Cypress, CA 90630

Internet address: systech1@ix.netcom.com

Hours of operation (7:30-6:00, Mon.-Fri.)

Technical support (8:30-6:00, Mon.-Fri.)



Prices, specifications, terms and conditions, and warranty are subject to change without notice. Intel Inside and Pentium Processor logos are registered trademarks of Intel Corporation. Sys Performance is a trademark of Sys Technology, Inc. All other trademarks, brands and product names are trademarks or trademarks of their respective companies.

CIRCLE 021 ON READER SERVICE CARD

We also accept personal and company checks and corporate purchase orders (OAC). Government sales welcome. Business equipment leasing available.

TECHNICALLY EXPLICIT MATERIAL ENCLOSED



Includes
Internet Access
Software!

COMPLETE
TEXT OF
PC MAGAZINE
OCTOBER 1993
TO
OCTOBER 1994

INCLUDES
Winstone

PC Magazine CD—the
most innovative PC
tool ever developed.
Now 30% off when you
subscribe!

It's one thing to read about cutting-edge technology. Now, with PC Magazine CD—the on-screen companion to PC Magazine—you can see, hear and interact with it.

Just one click lets you: Walk through the newest software suites... download PC Bench 9.0, Winbench 95 and Winstone 95... pull up data and results not available in print or online... experience exclusive multimedia product demonstrations... get working samples of real applications to run on your system... access everything ever published in PC Magazine during the previous 12 months.

All this at our lowest-time-ever rate of just \$49.95 for four power-packed releases—30% off the single-disc price! Call right away to start your subscription to PC Magazine CD. There's nothing else like it on the market today!

Call: 1 800-335-1195

Mention Priority Code 8FAA

P.O. Box 59494 • Boulder, CO 80332-9494

point size. I found that simply changing the tracking value from None to Normal solved the loose-line problem. If you apply tracking values locally, you can do it from the Type menu or the Control Panel. By setting tracking as part of a text style (Define Styles | New | Type | Tracking), you can apply the effect automatically to all paragraphs formatted with that style.

Adjusting PageMaker's letter and word spacing is actually the last technique I'd recommend, however. The truth is that PageMaker's default settings produce excellent results for a wide vari-

*Changing PageMaker's
default settings without
understanding how the
new values will affect line
breaks can cause more
problems than it solves.*

ety of documents. Changing these settings without understanding how the new values will affect line breaks can cause more problems than it solves. In the example shown in Figure 4, however, I would consider lowering the minimum word spacing from 75 percent to 50 percent, which will cause PageMaker to tighten word spacing and correct the overly loose line. But rather than alter PageMaker's word and letter spacing globally for the entire document, I'd incorporate the new minimum word spacing into a defined type style.

Using PageMaker 5.0 and a PostScript Level 2 printer, I tried unsuccessfully to reproduce the erratic word spacing in your printout. Though the lines were loose in my printout, the spacing between the words was even, so this aspect of the problem may be specific to your system. I'd strongly suggest that you double check your printer's PostScript driver. Very often printing anomalies such as the one you describe can be corrected by updating the PostScript driver to a more current version.—Luisa Simone

U.S. SAVINGS BONDS FOR EDUCATION GROW ALMOST AS FAST AS KIDS DO.

Buy U.S. Savings Bonds — for half their face value — where you work or bank. If you keep them five years or more, you'll earn competitive, market-based rates or a guaranteed minimum rate, whichever is higher.

For current rate information, call 1-800-4US BOND • 1-800-487-2663



A public service of this magazine



Since 1977

Hartford Computer Group

YOUR FULL-CYCLE RESELLER

**HEWLETT
PACKARD**

\$997

Deskjet 1200C



Deskjet 320-540
Deskjet 160C
Deskjet 1200C/CP5
LaserJet 5L/5P
OfficeJet Printer

\$298.284

469.00

997.158.7

499.949

789.00

OKIDATA

(\$50 End User Rebate from OKI
on OL400e until 8/31)

ML320 DM Printer	\$334.08
ML321 DM Printer	468.67
ML380 DM Printer	233.13
ML395 DM Printer	1061.12
ML395C DM Printer	1132.02
ML520 DM Printer	401.38
ML521 DM Printer	535.97
ML580 DM Printer	468.67
ML591 DM Printer	635.71
OL400E Laser Printer	415.80
OL410E Laser Printer	545.60
OL410E PS Laser Printer PS	766.70
OL810 Laser Printer	919.60
OL810E Laser Printer	765.60
OL1200 Laser Printer	1107.70
OKI 2010 Ink Jet Printer	364.10

U-Mailbox

\$107.80

14.4 External w/FAX

28.8 v 34 Internal w/FAX Sportster	\$220.00
28.8 v 34 External w/FAX Sportster	23.60
14.4 Int w/FAX Sportster	92.95
14.4 Ext w/FAX Sportster	107.80
Coupler Dual STD 14.4 PCMCIA	348.60
Coupler v 34 Int Ext	379.50
Coupler Dual STD 28.8 PCMCIA	412.50
	390.50

CTX

notebooks

\$2053

DX2/66 4MB 340HD

DX2/66 4MB 340HD	\$2053.00
DX2/66 8MB 520HD	2498.00
DX4/75 4MB 340HD	3070.00
DX4/75 8MB 520HD	3455.00
DX4/100 8MB 810HD	3599.00

COMPUTERS

TOSHIBA

4800CT 500 ACT	\$2719.79
4850CT 475 500MB ACT 8MB	2889.83
4850CT 475 772MB ACT 8MB	3058.87
4800CT P75 772MB ACT	4335.17
CT610C Pent 90MHz 720MB Act	3952.58
T2100 DX2/50 Mono 250MB 4MB	1274.45
T2100 DX2/50 Dual Scan 330MB 4MB	1954.61
T2100 DX2/50 Act 330MB 8MB	2379.71
T2150 DX4/75 Dual Sc 500MB CD 4MB	2719.79
T2150 DX4/75 Act 500MB CD 8MB	3229.91
T2130CS DX4/75 Dual Sc 500MB 8MB	2337.20
T2130CS DX4/75 Act 500MB 8MB	2804.81
T2110CS DX4/75 Dual Sc 330MB 4MB	1954.61
T2450CT DX4/75 Act 320MB 8MB	2719.79
T2450CT DX4/75 Act 500MB 8MB	2904.81

TEXAS INSTRUMENTS

TM 4000M 475 455 ACT	\$2489.90
TM 4000M 475 455 Dual	2211.00
TM 4000M 475 524 ACT	3234.00
TM5000 P75 772MB Act 8MB PCI	5622.20
TM6000 P75 500MB Dual Scan 8MB PCI	5017.10

NEC

Versa V 450 340MB ACT Color	\$2409.00
Versa V450 540MB ACT Color	2700.50
Versa M 475 250MB Dual Color	2413.40
Versa M 475 340MB Dual Color	2508.00
Versa M 475 450MB ACT Color	2794.00
Versa M 475 340MB True Color	2823.70
Versa M 475 540MB ACT Color	3085.50
Versa M 475 540MB Hi-Res Color	3278.00
Versa M 4100 340MB ACT Color	3470.50
Versa M 4100 540MB Hi-Res Color	3951.20
Versa M 4100 540MB True Color	3469.40
Versa M 4100 810MB Hi-Res Color	4338.40

MONITORS

CTX

14" 1451C 28Hz	\$229.90	17" 1765CD	\$623.70
15" 1552CL	322.30	17" 1785GME	867.70
15" 1555B Digital	328.90	20" 2085X	1133.00
17" 1765GME	610.50		

MAG INNOVISION

14" 28 NI Flat	\$254.10	17" 26 NI Flat	685.30
15" 28 NI Flat	346.50	17" 26 NI FR 1600	850.30
15" 28 NI Flat	378.40	21" 28 NI FR 1600	1758.90

NANO

T2-17 17"	\$1276.00	T2-17TS 17" 25	1022.45
T2-15 15"	546.37	T2-20 20" 30	2011.90
T2-17 17" 28	871.53	F760W 21" 28	1991.00
F2-17EX 17" 25	964.32	F2-21 21" 25	2744.50

NEC

XV14 14"	\$313.92	XP21 21"	1809.40
XV15 15"	441.45	XP15 15"	586.60
XV17 17"	763.00	XP17 17"	1046.40
XE15 15"	548.27	XP21 21"	2188.72
XE17 17"	1010.43		

SONY

14" Trinitron	\$295.90
15" 1561 Multiscan Digital Monitor	471.90
17" 1766 Multiscan Digital Monitor	1061.50
17" 1766 Multiscan Digital Monitor	863.50
20" 2066 Multiscan Digital Monitor	1941.50

NOKIA

446E 15" 28"	\$453.20
447L 17" 28" Blue, Black, Green, or Red	891.90
447X 17" 25"	1017.50
446X 21" 28" TCO	2550.50
446X 21" 28"	2152.70

If you can not find the monitor you want CALL US and we'll help you find it at our low everyday discounted prices!

PRINTERS

CANON

BJ10SX	\$253.00	LBP1200	\$1314.50
BJ200EX	237.60	BJ230	409.20
BJC4000	363.00	BJC600e	485.10
LBP4300	599.50	BJ30 Ink Jet Printer	286.20
LBP600	979.00		

EPSON

LX300	\$168.34	LQ1170	\$628.01
LQ570	247.61	LQ2550	971.09
LQ1070	378.64	DPX5000+	1394.40
FX870	289.28	DPX9000	2455.95
FX1170	377.06	Stylus 800+	216.64
LQ300	182.96	Stylus 1000+	438.48
LQ670	441.00	Stylus Color	505.26

PANASONIC

1150	\$131.87	2624	\$403.49
3626	403.43	3123	247.58
2023	179.82	4400Laser	449.66
2130	201.69	5400Laser	486.60
2135 Color	246.02		

TEXAS INSTRUMENTS

Micro Laser 600	\$857.63
Micro Laser Pro 600 PS23	1198.19
Micro Laser Pro E	1368.84
Micro Laser Pro Pro	1624.15

TAP & REMOVABLE MEDIA DRIVES

IOmega

All Zip Drives	Call
All Dmo Drives	Call
Bermoult 230MB Insider SCSI	289.40
Bermoult 230MB Transportable	543.40

COLORADO MEMORY SYSTEMS

Trakker 350 Parallel	\$269.50
Trakker 700 Parallel	332.20
Jumbo 400 Internal	283.80
Jumbo 350 Internal	135.30
Jumbo 700 Internal	180.20

BATTERY BACKUP

AMERICAN POWER CONVERSION

Smart400	\$268.40	Back400	\$136.40
Smart600	324.50	Back600	185.00
Smart900	460.90	Back900	229.90
Smart1250	578.60	Back1200	326.70
Back280	94.60	Back1250	425.70

TRIPLITE

BCPERS280	92.40	Smart 450LAN	282.90
BC400	129.80	Smart 500LAN	278.30
BCPERS500	161.70	Smart 675LAN	300.30
BCPRO550	176.00	Smart 850LAN	376.20
BCPRO675	215.60	Smart 1050LAN	436.70
BCPRO1050	308.00	Smart1250LAN	546.70
BCPRO1400	399.30	Smart1400LAN	558.60
Smart 280LAN	209.00		

NETWORKING PRODUCTS

NOVELL

Network v4.1			
5 user	\$665.00	50 user	\$2995.00
10 user	1499.00	100 user	4075.00
25 user	2225.00		
Network v3.32			
5 user	\$605.00	50 user	\$2775.00
10 user	1395.00	100 user	3885.00
25 user	2050.00		
Personal Network			
1 user	\$59.00	5 user	\$259.00

SCANNERS

RELISYS

2412	Call
4816	999.00
9612	1499.00
HandScan 8	85.00
Handheld Morphing Scan	179.00
HandScan 21 w/ Coral Draw 4	245.00
Avec Color 2400	499.00
HomeScan Scanner/Fax	328.00

H.P.

Scanjet 3 Color Scanner	\$928.80
Scanjet 3P Mono	319.00

UMAX

Vista-S6 Scanner	\$566.50
Vista-S8 Scanner	710.60
Vista-1630 Scanner	475.20
UC1280 Scanner	762.30
Powerlook Flatbed 1200 X 800 Scanner	2552.00

EPSON

Action Scanning System	\$508.86
ES1000C	738.27
ES1200C	923.73

MODEMS

PRACTICAL PERIPHERAL

14.4 Internal w/Fax	\$71.50
14.4 Mini Tower w/Fax	88.00
V.34 28.8 Internal w/Fax	189.20
V.34 28.8 Mini Tower w/Fax	208.80

MEGAHERTZ

14.4 Data/Fax X Jack PCMCIA	\$170.50
V.34 X Jack PCMCIA	308.00

BOCA

14.4 Internal w/Fax	\$73.70
14.4 External w/Fax	96.80
V.34 28.8 Internal w/Fax	159.50
V.34 28.8 External w/Fax	205.70
Sound Expression 14.4 Voice	109.50

HAYES

Accura 14.4 Internal w/Fax	\$91.30
Accura 14.4 External w/Fax	106.70
Accura 28.8 V.34 Internal w/Fax	181.50
Accura 28.8 V.34 External w/Fax	214.50
Optima 14.4 External w/Fax	377.30
Optima 14.4 Internal w/Fax	377.30
Optima 28.8 V.34 External w/Fax	424.60
Optima 28.8 V.34 Internal w/Fax	365.20

\$69

Universal Note	
Note Pac	\$9.00
Universal Note	69.00
Leather Notebook	89.00
Business Commuter	119.00
Sherpa Travel Case	179.00

3COM

3C509B Etherlink III 10BT	\$108.00
3C509B Etherlink III coax	109.00
3C509B Etherlink III combo	119.00
3C503 Etherlink II coax	159.00
3C579 Etherlink EISA 10BT	225.00
3C579 Etherlink EISA 10BT	225.00
3C1627 12 port Linkbuilder 10BT	629.00

SMC

Ultra 16 Ethernet coax or 10BT	\$92.00
Ultra 16 Ethernet coax	105.00
PC60WS ARCNET coax	115.00

MULTIMEDIA

AI TECH

Pro PC TV	\$138.05
Wavewatcher TV	306.57
MultPro CTV	232.87

TURTLE BEACH

Monte Carlo 16 Bit Sound Card	\$85.80
Monterey 16 Bit Sound Card	240.90
Tropez 16 Bit Sound Card	201.30

Media Speakers

ALTEC LANSING

ACS 51 Speakers	\$64.90	ACS 500	\$289.30
ACS 52 Speakers	90.20	ACS 300.1	192.50
ACS 53	116.60		

SONY

SRS-86PC	\$114.68
CSS-8100	78.05
SRS-D2KPC	126.15

CREATIVE LABS

Omn CD	\$117.67
Sound Blaster Pro Value Edition	71.02
Sound Blaster 16 SCSI-2	165.85
Sound Blaster AWE 32 Value Edition	152.90
Sound Blaster AWE 32	265.38
Sound Blaster 16 Value Edition IDE	89.27
Discovery CD New Edition MM Kit Dual	262.70
Discovery CD 16 4X MM Kit	327.47
Digital Sound House 2x Kit Int	208.85

Multimedia CD-ROMs

NEC

2V Deluxe Dual CD Rom	\$ 289.30
3Xp	398.30
3Xp Plus Kit	462.00
6Xe External CD Rom 6 Speed	562.10

Back up!



Before all your hard work goes down
the drain.

Why risk losing your data
when it's so easy to **BACK UP**
with a **backpack 800T** tape
drive?

The **backpack 800T** stores
up to 800MB of data on a
single Travan™ TR-1 tape.

No slots? No problem.
There are no cards to install.



backpack
800T
MicroSolutions

Call Toll Free - 800.293.1214

Plug the **backpack 800T**
into your computer's printer
port; plug your printer into
the port on the back of the
tape drive (Windows™ and
DOS backup software is
included free).

Join the **backpack** drive family
today... Easy plug and play
tape back up, CD-ROM, hard
disk and diskette drives.

TRAVAN
TECHNOLOGY
Travan is a trademark of IBM

132 W. Lincoln Hwy. DeKalb, Illinois 60115 • Telephone 815.756.3411 • FAX 815.756.2928 • CDW - 800.736.4239 • Global Computer Supplies - 800.845.6225
Inmac - 800.547.5444 • Micro Warehouse - 800.367.7080 • PC Connection, Inc. - 800.800.5555 • PCs Complete, Inc. - 800.514.4727 • USA Flex - 800.872.3539

CIRCLE 859 ON READER SERVICE CARD

NOW AVAILABLE WITH 16-BIT BUILT-IN SOUND OPTION!



One Portable CD-ROM Drive — Two Simple Steps



With the backpack quad-speed CD-ROM drive, you're one cable connection away from a world of multimedia business advantages: Plug it into your PC parallel port to access a universe of CD-ROM titles. Take it with you for portable data retrieval. Or share it with other PCs.



backpack

MicroSolutions

Call Toll Free - 800.293.1214

No compatibility problems with virtually any IBM-compatible PC—Windows, DOS or OS/2. No taking your PC apart to install this quad-speed drive. Just plug it into your PC printer port—plug your printer into the backpack. A simple solution from the backpack family of tape, diskette and hard drives.

WE WILL TRY TO MATCH OR BEAT ANY ADVERTISED PRICE. CALL FOR LATEST PRICING!!

WE ACCEPT PO'S
FROM QUALIFIED FIRMS

M E M O R Y

SECURITY WILL CALL WINDOW NOW OPEN!
NO SURCHARGE FOR MC, VISA & DISCOVER

CACHE MEMORY

Model	128KB	256KB	512KB	1MB
32Kx8	19.00	25.00	35.00	45.00
32Kx8 (3.3V)	-	11.00	21.00	31.00
64Kx8	-	11.00	21.00	31.00
128Kx8	-	11.00	21.00	31.00

Individual D-RAM Chips

INTEL Math Chips

Model	128KB	256KB	512KB	1MB
100ns	4.00	6.00	8.00	10.00
150ns	4.00	6.00	8.00	10.00
200ns	4.00	6.00	8.00	10.00
250ns	4.00	6.00	8.00	10.00
300ns	4.00	6.00	8.00	10.00
350ns	4.00	6.00	8.00	10.00
400ns	4.00	6.00	8.00	10.00
450ns	4.00	6.00	8.00	10.00
500ns	4.00	6.00	8.00	10.00
550ns	4.00	6.00	8.00	10.00
600ns	4.00	6.00	8.00	10.00
650ns	4.00	6.00	8.00	10.00
700ns	4.00	6.00	8.00	10.00
750ns	4.00	6.00	8.00	10.00
800ns	4.00	6.00	8.00	10.00
850ns	4.00	6.00	8.00	10.00
900ns	4.00	6.00	8.00	10.00
950ns	4.00	6.00	8.00	10.00
1000ns	4.00	6.00	8.00	10.00

CYRIX DRx 386 to 486 Upgrade

Clock Doubler

• Single chip upgrade solution	CX486 DRx 25/50	229.00
• Clock doubling technology	CX486 DRx 33/66	279.00
• Compatible with industry standard 386/486 CPU socket	CX486 SRx 25/50	229.00
• Compatible with DOS Windows, 3.X, DOS 1.3 and 2.x		
• Uses industry standard north chip		
• Easy to install—about 15 minutes		

DIMM MODULES

Model	128KB	256KB	512KB	1MB
256 x 9	-	40.00	45.00	10.00
1Meg x 9 (3 chip)	-	40.00	45.00	10.00
1Meg x 9 (4 chip)	-	40.00	45.00	10.00
4Meg x 9	-	154.00	149.00	139.00
16Meg x 9 3 chip	-	-	569.00	-

72 PIN SIMMS (EISA), EDO

Model	128KB	256KB	512KB	1MB
256 x 36	-	50.00	50.00	-
112 x 36 2 Meg	-	180.00	179.00	364.00
112 x 36 4 Meg	-	329.00	329.00	364.00
112 x 36 8 Meg	-	589.00	589.00	549.00
112 x 36 16 Meg	-	1189.00	1189.00	1149.00
112 x 36 32 Meg	-	2389.00	2389.00	2349.00
112 x 36 64 Meg	-	4789.00	4789.00	4749.00
112 x 36 128 Meg	-	9589.00	9589.00	9549.00
112 x 36 256 Meg	-	19189.00	19189.00	19149.00
112 x 36 512 Meg	-	38389.00	38389.00	38349.00
112 x 36 1024 Meg	-	76789.00	76789.00	76749.00
112 x 36 2048 Meg	-	153589.00	153589.00	153549.00
112 x 36 4096 Meg	-	307189.00	307189.00	307149.00
112 x 36 8192 Meg	-	614389.00	614389.00	614349.00
112 x 36 16384 Meg	-	1228789.00	1228789.00	1228749.00
112 x 36 32768 Meg	-	2457589.00	2457589.00	2457549.00
112 x 36 65536 Meg	-	4915189.00	4915189.00	4915149.00
112 x 36 131072 Meg	-	9830389.00	9830389.00	9830349.00
112 x 36 262144 Meg	-	19660789.00	19660789.00	19660749.00
112 x 36 524288 Meg	-	39321589.00	39321589.00	39321549.00
112 x 36 1048576 Meg	-	78643189.00	78643189.00	78643149.00
112 x 36 2097152 Meg	-	157286389.00	157286389.00	157286349.00
112 x 36 4194304 Meg	-	314572789.00	314572789.00	314572749.00
112 x 36 8388608 Meg	-	629145589.00	629145589.00	629145549.00
112 x 36 16777216 Meg	-	1258291189.00	1258291189.00	1258291149.00
112 x 36 33554432 Meg	-	2516582389.00	2516582389.00	2516582349.00
112 x 36 67108864 Meg	-	5033164789.00	5033164789.00	5033164749.00
112 x 36 134217728 Meg	-	10066329589.00	10066329589.00	10066329549.00
112 x 36 268435456 Meg	-	20132659189.00	20132659189.00	20132659149.00
112 x 36 536870912 Meg	-	40265318389.00	40265318389.00	40265318349.00
112 x 36 1073741824 Meg	-	80530636789.00	80530636789.00	80530636749.00
112 x 36 2147483648 Meg	-	161061273589.00	161061273589.00	161061273549.00
112 x 36 4294967296 Meg	-	322122547189.00	322122547189.00	322122547149.00
112 x 36 8589934592 Meg	-	644245094389.00	644245094389.00	644245094349.00
112 x 36 17179869184 Meg	-	1288490188789.00	1288490188789.00	1288490188749.00
112 x 36 34359738368 Meg	-	2576980377589.00	2576980377589.00	2576980377549.00
112 x 36 68719476736 Meg	-	5153960755189.00	5153960755189.00	5153960755149.00
112 x 36 137438953472 Meg	-	10307921510389.00	10307921510389.00	10307921510349.00
112 x 36 274877906944 Meg	-	20615843020789.00	20615843020789.00	20615843020749.00
112 x 36 549755813888 Meg	-	41231686041589.00	41231686041589.00	41231686041549.00
112 x 36 1099511627776 Meg	-	82463372083189.00	82463372083189.00	82463372083149.00
112 x 36 2199023255552 Meg	-	164926744166389.00	164926744166389.00	164926744166349.00
112 x 36 4398046511104 Meg	-	329853488332789.00	329853488332789.00	329853488332749.00
112 x 36 8796093022208 Meg	-	659706976665589.00	659706976665589.00	659706976665549.00
112 x 36 17592186044416 Meg	-	1319413953331189.00	1319413953331189.00	1319413953331149.00
112 x 36 35184372088832 Meg	-	2638827906662389.00	2638827906662389.00	2638827906662349.00
112 x 36 70368744177664 Meg	-	5277655813324789.00	5277655813324789.00	5277655813324749.00
112 x 36 140737488355328 Meg	-	10555311626649589.00	10555311626649589.00	10555311626649549.00
112 x 36 281474976710656 Meg	-	21110623253299189.00	21110623253299189.00	21110623253299149.00
112 x 36 562949953421312 Meg	-	42221246506598389.00	42221246506598389.00	42221246506598349.00
112 x 36 1125899906842624 Meg	-	84442493013196789.00	84442493013196789.00	84442493013196749.00
112 x 36 2251799813685248 Meg	-	168884986026393589.00	168884986026393589.00	168884986026393549.00
112 x 36 4503599627370496 Meg	-	337769972052787189.00	337769972052787189.00	337769972052787149.00
112 x 36 9007199254740992 Meg	-	675539944105574389.00	675539944105574389.00	675539944105574349.00
112 x 36 18014398509481984 Meg	-	1351079888211148789.00	1351079888211148789.00	1351079888211148749.00
112 x 36 36028797018963968 Meg	-	2702159776422297589.00	2702159776422297589.00	2702159776422297549.00
112 x 36 72057594037927936 Meg	-	5404319552844595189.00	5404319552844595189.00	5404319552844595149.00
112 x 36 144115188075855872 Meg	-	10808639105689190389.00	10808639105689190389.00	10808639105689190349.00
112 x 36 288230376151711744 Meg	-	21617278211378380789.00	21617278211378380789.00	21617278211378380749.00
112 x 36 576460752303423488 Meg	-	43234556422756761589.00	43234556422756761589.00	43234556422756761549.00
112 x 36 1152921504606846976 Meg	-	86469112845513523189.00	86469112845513523189.00	86469112845513523149.00
112 x 36 23058430092136939536 Meg	-	172938225691027046389.00	172938225691027046389.00	172938225691027046349.00
112 x 36 46116860184273879072 Meg	-	345876451382054092789.00	345876451382054092789.00	345876451382054092749.00
112 x 36 92233720368547758144 Meg	-	691752902764108185589.00	691752902764108185589.00	691752902764108185549.00
112 x 36 184467440737095516288 Meg	-	1383505805528216371189.00	1383505805528216371189.00	1383505805528216371149.00
112 x 36 368934881474191032576 Meg	-	2767011611056432742389.00	2767011611056432742389.00	2767011611056432742349.00
112 x 36 7378697629483820651536 Meg	-	5534023222112865484789.00	5534023222112865484789.00	5534023222112865484749.00
112 x 36 14757395258967641303072 Meg	-	11068046444225730889589.00	11068046444225730889589.00	11068046444225730889549.00
112 x 36 29514790517935282606144 Meg	-	22136092888451461779189.00	22136092888451461779189.00	22136092888451461779149.00
112 x 36 59029581035870565212288 Meg	-	44272185776902923558389.00	44272185776902923558389.00	44272185776902923558349.00
112 x 36 118059162071751130424576 Meg	-	88544371553805847116789.00	88544371553805847116789.00	88544371553805847116749.00
112 x 36 236118324143502260849152 Meg	-	177088743107611694233589.00	177088743107611694233589.00	177088743107611694233549.00
112 x 36 472236648287004521698304 Meg	-	354177486215223388467189.00	354177486215223388467189.00	354177486215223388467149.00
112 x 36 944473296574009043396608 Meg	-	708354972430446776934389.00	708354972430446776934389.00	708354972430446776934349.00
112 x 36 1888946531148018086793216 Meg	-	1416709944860893553868789.00	1416709944860893553868789.00	1416709944860893553868749.00
112 x 36 3777893062296036173586432 Meg	-	2833419889721787107737589.00	2833419889721787107737589.00	2833419889721787107737549.00
112 x 36 7555786124592072347172864 Meg	-	5666839779443574215475189.00	5666839779443574215475189.00	5666839779443574215475149.00
112 x 36 15111572249184144694345728 Meg	-	11333679558887148430950389.00	11333679558887148430950389.00	11333679558887148430950349.00
112 x 36 30223144498368289388691456 Meg	-	22667359117774296881900789.00	22667359117774296881900789.00	22667359117774296881900749.00
112 x 36 60446288996736576777382912 Meg	-	45334718235548593763801589.00	45334718235548593763801589.00	45334718235548593763801549.00
112 x 36 120892579193473153554765824 Meg	-	90669436471097187527603189.00	90669436471097187527603189.00	90669436471097187527603149.00
112 x 36 241785158386946307109531648 Meg	-	181338872942194375055206389.00	181338872942194375055206389.00	181338872942194375055206349.00
112 x 36 483570316773892614219063296 Meg	-	3626777458843887501104126789.00	3626777458843887501104126789.00	3626777458843887501104126749.00
112 x 36 967140633547785228438126592 Meg	-	7253554917687775002208253589.00	7253554917687775002208253589.00	7253554917687775002208253549.00
112 x 36 1934281267095570456876253184 Meg	-	14507109355375550004416507189.00	14507109355375550004416507189.00	14507109355375550004416507149.00
112 x 36 3868562534191140913752506368 Meg	-	29014218710751100008833014389.00	29014218710751100008833014389.00	290142187107511000088330143849.00
112 x 36 7737125068382281827505012736 Meg	-	580284374215022000176660287789.00	580284374215022000176660287789.00	5802843742150220001766602877849.00
112 x 36 15474250136764563655010025472 Meg	-	1160568748430044000353320575589.00	1160568748430044000353320575589.00	11605687484300440003533205755849.00
112 x 36 30948500273529127311020050944 Meg	-	2321137496860088000706641151189.00	2321137496860088000706641151189.00	2321

WE WILL TRY TO MATCH OR BEAT ANY ADVERTISED PRICE. CALL FOR LATEST PRICING!!

WE ACCEPT PO'S
FROM QUALIFIED FIRMS

M E M O R Y

SECURITY WILL CALL WINDOW NOW OPEN!
NO SURCHARGE FOR MC, VISA AE & DISCOVER

NOTEBOOK BATTERIES

Manufacturer	System	Specs	Model	Price
Acer	AcerNote 730C, 735C AcerNote 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
Apple	PowerBook 150, 160, 165C PowerBook 170, 180C PowerBook Duo 270C, 280C	8.4V 1500mAh NiMH 8.4V 1500mAh NiMH 8.4V 1500mAh NiMH	B101 B102 B103	54.00 54.00 54.00
AST	AstoriaNote 730C, 735C AstoriaNote 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
ATI	ATI Note 730C, 735C ATI Note 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
Compaq	Compaq Note 730C, 735C Compaq Note 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
Epson	Epson Note 730C, 735C Epson Note 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
IBM	IBM Note 730C, 735C IBM Note 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
NEC	NEC Note 730C, 735C NEC Note 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
Panasonic	Panasonic Note 730C, 735C Panasonic Note 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
Sony	Sony Note 730C, 735C Sony Note 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00
Toshiba	Toshiba Note 730C, 735C Toshiba Note 7600C, 7600C	5.0V 5000mAh NiMH 5.0V 5000mAh NiMH	BT01 BT02	129.00 139.00

BATTERY CHARGER

HyperCharger/Conditioner
Multifunctional Battery Charger and Conditioner for Laptop and Notebook Computers

- Two Charging Days - Ultra-Initiated Battery Conditioning Cycle - Battery Status Monitoring
- Full Microprocessor Charge Control - Includes AC Power Adapter
- Now recharge and condition your NiCd (Nickle Cadmium) and NiMH (Nickle Metal Hydride) batteries quickly and easily with Xerox's HyperCharger/Conditioner

Manufacturer	System	Model	Price
Apple	PowerBook 140, 150, 160, 165C PowerBook 170, 180C	C108	159.00
Compaq	Compaq Aero 425, 435C Compaq Aero 450C, 460C	C205	199.00
Epson	AcerNote 730C, 735C AcerNote 7600C, 7600C	C305	199.00
IBM	IBM Note 730C, 735C IBM Note 7600C, 7600C	C306	199.00
NEC	NEC Note 730C, 735C NEC Note 7600C, 7600C	C307	199.00
Panasonic	Panasonic Note 730C, 735C Panasonic Note 7600C, 7600C	C308	199.00
Sony	Sony Note 730C, 735C Sony Note 7600C, 7600C	C309	199.00
Toshiba	Toshiba Note 730C, 735C Toshiba Note 7600C, 7600C	C310	199.00

MICROBOLT DC AUTO ADAPTER

High Quality, Small and Lightweight Auto Power Adapters for On-the-Go Notebook Power and Battery Recharging.

- Power and Recharge Notebook On-the-Go - Perfect for Cars, Boats and RVs
- Very Small and Lightweight - Power Status Monitoring LEDs
- Now you can power your notebook computer and recharge batteries from any standard 12 Volt DC cigarette lighter. Great in cars, boats and RVs. Microbolt enables you to operate your notebook in the vehicle or recharge your battery on the way to your next appointment.

Manufacturer	System	Model	Price
Acer	AcerNote 730C, 735C, 7600C, 7600C	MT02	89.00
Apple	PowerBook 140, 150, 160, 165C PowerBook 170, 180C	MT01	89.00
Compaq	Compaq Aero 425, 435C Compaq Aero 450C, 460C	MT03	89.00
Epson	AcerNote 730C, 735C AcerNote 7600C, 7600C	MT04	89.00
IBM	IBM Note 730C, 735C IBM Note 7600C, 7600C	MT05	89.00
NEC	NEC Note 730C, 735C NEC Note 7600C, 7600C	MT06	89.00
Panasonic	Panasonic Note 730C, 735C Panasonic Note 7600C, 7600C	MT07	89.00
Sony	Sony Note 730C, 735C Sony Note 7600C, 7600C	MT08	89.00
Toshiba	Toshiba Note 730C, 735C Toshiba Note 7600C, 7600C	MT09	89.00

MICROBOLT DC AUTO ADAPTER (Cont'd)

Manufacturer	System	Model	Price
Acer	AcerNote 730C, 735C, 7600C, 7600C	MT02	89.00
Apple	PowerBook 140, 150, 160, 165C PowerBook 170, 180C	MT01	89.00
Compaq	Compaq Aero 425, 435C Compaq Aero 450C, 460C	MT03	89.00
Epson	AcerNote 730C, 735C AcerNote 7600C, 7600C	MT04	89.00
IBM	IBM Note 730C, 735C IBM Note 7600C, 7600C	MT05	89.00
NEC	NEC Note 730C, 735C NEC Note 7600C, 7600C	MT06	89.00
Panasonic	Panasonic Note 730C, 735C Panasonic Note 7600C, 7600C	MT07	89.00
Sony	Sony Note 730C, 735C Sony Note 7600C, 7600C	MT08	89.00
Toshiba	Toshiba Note 730C, 735C Toshiba Note 7600C, 7600C	MT09	89.00

DIGITAL EQUIPMENT CORPORATION

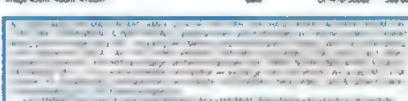
Model No.	Capacity	DEM Part No.	Price
DEC Alpha 410, 500, 580	4MB	FR-PC700-4A	179.00
DEC Alpha 410, 500, 580	8MB	FR-PC700-8A	339.00
DEC Alpha 410, 500, 580	16MB	FR-PC700-16A	639.00
DEC Alpha 410, 500, 580	32MB	FR-PC700-32A	1199.00
DEC Alpha 410, 500, 580	64MB	FR-PC700-64A	2199.00
DEC Alpha 410, 500, 580	128MB	FR-PC700-128A	4199.00
DEC Alpha 410, 500, 580	256MB	FR-PC700-256A	7999.00
DEC Alpha 410, 500, 580	512MB	FR-PC700-512A	14999.00
DEC Alpha 410, 500, 580	1GB	FR-PC700-1GB	27999.00

EPSON

Model No.	Capacity	DEM Part No.	Price
Epson 450C, 450C, 450C, 450C	4MB	FR-PC700-4A	179.00
Epson 450C, 450C, 450C, 450C	8MB	FR-PC700-8A	339.00
Epson 450C, 450C, 450C, 450C	16MB	FR-PC700-16A	639.00
Epson 450C, 450C, 450C, 450C	32MB	FR-PC700-32A	1199.00
Epson 450C, 450C, 450C, 450C	64MB	FR-PC700-64A	2199.00
Epson 450C, 450C, 450C, 450C	128MB	FR-PC700-128A	4199.00
Epson 450C, 450C, 450C, 450C	256MB	FR-PC700-256A	7999.00
Epson 450C, 450C, 450C, 450C	512MB	FR-PC700-512A	14999.00
Epson 450C, 450C, 450C, 450C	1GB	FR-PC700-1GB	27999.00

NEC

Model No.	Capacity	DEM Part No.	Price
NEC 450C, 450C, 450C, 450C	4MB	FR-PC700-4A	179.00
NEC 450C, 450C, 450C, 450C	8MB	FR-PC700-8A	339.00
NEC 450C, 450C, 450C, 450C	16MB	FR-PC700-16A	639.00
NEC 450C, 450C, 450C, 450C	32MB	FR-PC700-32A	1199.00
NEC 450C, 450C, 450C, 450C	64MB	FR-PC700-64A	2199.00
NEC 450C, 450C, 450C, 450C	128MB	FR-PC700-128A	4199.00
NEC 450C, 450C, 450C, 450C	256MB	FR-PC700-256A	7999.00
NEC 450C, 450C, 450C, 450C	512MB	FR-PC700-512A	14999.00
NEC 450C, 450C, 450C, 450C	1GB	FR-PC700-1GB	27999.00



CUSTOMER SERVICE & GUARANTEE: OPEN M-F, 9-4 PST
All products brand new & guaranteed. We buy excess inventory.
Trademarks are registered with their respective companies.



22225 Lockness Avenue • Torrance, CA 90501

NEC (Continued)

Model No.	Capacity	DEM Part No.	Price
NEC 450C, 450C, 450C, 450C	4MB	FR-PC700-4A	179.00
NEC 450C, 450C, 450C, 450C	8MB	FR-PC700-8A	339.00
NEC 450C, 450C, 450C, 450C	16MB	FR-PC700-16A	639.00
NEC 450C, 450C, 450C, 450C	32MB	FR-PC700-32A	1199.00
NEC 450C, 450C, 450C, 450C	64MB	FR-PC700-64A	2199.00
NEC 450C, 450C, 450C, 450C	128MB	FR-PC700-128A	4199.00
NEC 450C, 450C, 450C, 450C	256MB	FR-PC700-256A	7999.00
NEC 450C, 450C, 450C, 450C	512MB	FR-PC700-512A	14999.00
NEC 450C, 450C, 450C, 450C	1GB	FR-PC700-1GB	27999.00

HEWLETT PACKARD

Model No.	Capacity	DEM Part No.	Price
HP 450C, 450C, 450C, 450C	4MB	FR-PC700-4A	179.00
HP 450C, 450C, 450C, 450C	8MB	FR-PC700-8A	339.00
HP 450C, 450C, 450C, 450C	16MB	FR-PC700-16A	639.00
HP 450C, 450C, 450C, 450C	32MB	FR-PC700-32A	1199.00
HP 450C, 450C, 450C, 450C	64MB	FR-PC700-64A	2199.00
HP 450C, 450C, 450C, 450C	128MB	FR-PC700-128A	4199.00
HP 450C, 450C, 450C, 450C	256MB	FR-PC700-256A	7999.00
HP 450C, 450C, 450C, 450C	512MB	FR-PC700-512A	14999.00
HP 450C, 450C, 450C, 450C	1GB	FR-PC700-1GB	27999.00

NeXT

Model No.	Capacity	DEM Part No.	Price
NeXT 450C, 450C, 450C, 450C	4MB	FR-PC700-4A	179.00
NeXT 450C, 450C, 450C, 450C	8MB	FR-PC700-8A	339.00
NeXT 450C, 450C, 450C, 450C	16MB	FR-PC700-16A	639.00
NeXT 450C, 450C, 450C, 450C	32MB	FR-PC700-32A	1199.00
NeXT 450C, 450C, 450C, 450C	64MB	FR-PC700-64A	2199.00
NeXT 450C, 450C, 450C, 450C	128MB	FR-PC700-128A	4199.00
NeXT 450C, 450C, 450C, 450C	256MB	FR-PC700-256A	7999.00
NeXT 450C, 450C, 450C, 450C	512MB	FR-PC700-512A	14999.00
NeXT 450C, 450C, 450C, 450C	1GB	FR-PC700-1GB	27999.00

SUN

Model No.	Capacity	DEM Part No.	Price
SUN 450C, 450C, 450C, 450C	4MB	FR-PC700-4A	179.00
SUN 450C, 450C, 450C, 450C	8MB	FR-PC700-8A	339.00
SUN 450C, 450C, 450C, 450C	16MB	FR-PC700-16A	639.00
SUN 450C, 450C, 450C, 450C	32MB	FR-PC700-32A	1199.00
SUN 450C, 450C, 450C, 450C	64MB	FR-PC700-64A	2199.00
SUN 450C, 450C, 450C, 450C	128MB	FR-PC700-128A	4199.00
SUN 450C, 450C, 450C, 450C	256MB	FR-PC700-256A	7999.00
SUN 450C, 450C, 450C, 450C	512MB	FR-PC700-512A	14999.00
SUN 450C, 450C, 450C, 450C	1GB	FR-PC700-1GB	27999.00

ZENITH

Model No.	Capacity	DEM Part No.	Price
Zenith 450C, 450C, 450C, 450C	4MB	FR-PC700-4A	179.00
Zenith 450C, 450C, 450C, 450C	8MB	FR-PC700-8A	339.00
Zenith 450C, 450C, 450C, 450C	16MB	FR-PC700-16A	639.00
Zenith 450C, 450C, 450C, 450C	32MB	FR-PC700-32A	1199.00
Zenith 450C, 450C, 450C, 450C	64MB	FR-PC700-64A	2199.00
Zenith 450C, 450C, 450C, 450C	128MB	FR-PC700-128A	4199.00
Zenith 450C, 450C, 450C, 450C	256MB	FR-PC700-256A	7999.00
Zenith 450C, 450C, 450C, 450C	512MB	FR-PC700-512A	14999.00
Zenith 450C, 450C, 450C, 450C	1GB	FR-PC700-1GB	27999.00

ZEOS

Model No.	Capacity	DEM Part No.	Price
ZEOS 450C, 450C, 450C, 450C	4MB	FR-PC700-4A	179.00
ZEOS 450C, 450C, 450C, 450C	8MB	FR-PC700-8A	339.00
ZEOS 450C, 450C, 450C, 450C	16MB	FR-PC700-16A	639.00
ZEOS 450C, 450C, 450C, 450C	32MB	FR-PC700-32A	1199.00
ZEOS 450C, 450C, 450C, 450C	64MB	FR-PC700-64A	2199.00
ZEOS 450C, 450C, 450C, 450C	128MB	FR-PC700-128A	4199.00
ZEOS 450C, 450C, 450C, 450C	256MB	FR-PC700-256A	7999.00
ZEOS 450C, 450C, 450C, 450C	512MB	FR-PC700-512A	14999.00
ZEOS 450C, 450C, 450C, 450C	1GB	FR-PC700-1GB	27999.00

310-539-0019
FAX: 310-539-5844

SECURITY WILL
CALL WINDOW
NOW OPEN

CALL
TOLL FREE

1-800-433-3726
(US and Canada)

ESTAB.
1983

Prices & Availability
Subject to Change
Without Notice

Mon-Fri, 8:00 a.m. to 3:00 p.m. PST
Sat. 10:00 a.m. to 12:00 noon

PRICES MAY FLUCTUATE. CALL FOR LATEST PRICING!!

CIRCLE 019 ON READER SERVICE CARD

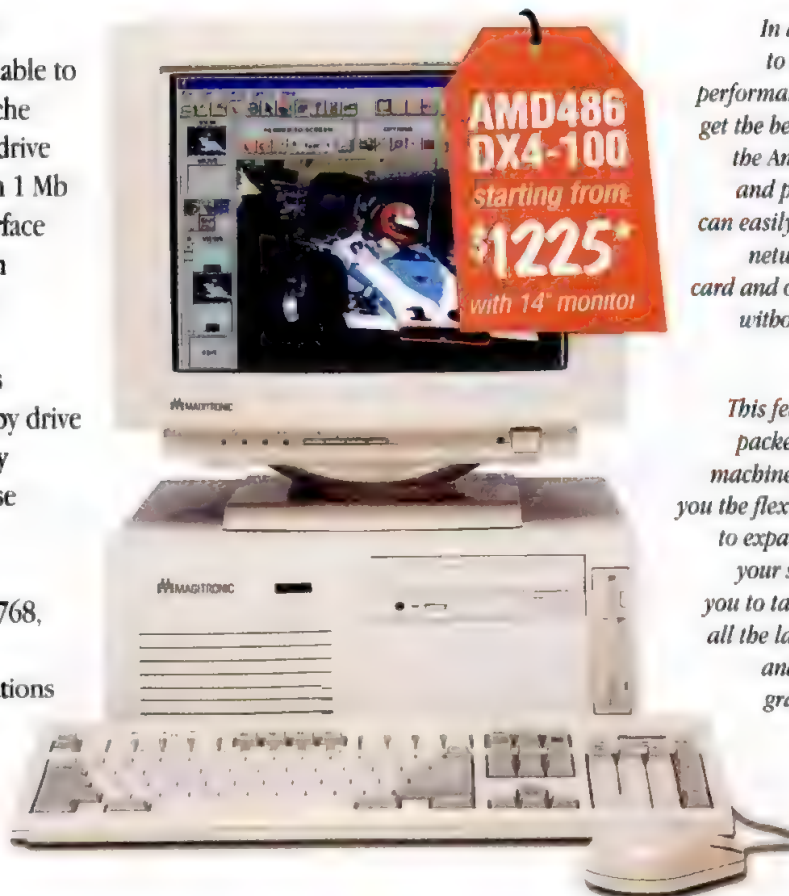
The Affordable Choice

Pentium Performance at a 486 Price.

SYSTEM FEATURES

- 8Mb RAM expandable to 128Mb, 256Kb cache
- 850Mb IDE hard drive
- PCI Graphics with 1 Mb
- PCI Fast IDE interface
- Desktop case with 5 expansion bays
- 3 PCI x 32 bit / 4 ISA x 16 bit slots
- 3.5" 1.44MB floppy drive
- Enhanced 101-key keyboard & mouse
- MS-DOS 6.22 & WFW 3.11
- 14" SVGA 1024 x 768, 28mm
- Custom configurations available

* Quad speed
CD ROM optional



In addition to superior performance, you get the benefits of the AmDX4-100's plug and play feature. You can easily add a modem, network card, video card and other peripherals without reconfiguring your system.

This feature-packed 486 machine gives you the flexibility to expand and upgrade your system, allowing you to take advantage of all the latest multimedia and comprehensive graphics packages.



NetWare
Tested and
Approved



Seagate



MAGITRONIC
THE POWER OF TECHNOLOGY



1-800-306-9336

Fax 404-441-1145



The Am486[®] microprocessor family is designed for high performance and software compatibility. Am486[®] microprocessors are 100% Microsoft[®] Windows[®] compatible.

Pentium is a trademark of Intel Corporation. Am486 is a trademark of Advanced Micro Devices. Seagate and Fast ATA 2 Logos are registered trademarks of Seagate Technology, Inc. All trademarks and logos are the property of their respective companies.

FOSA

the leading notebook technology

Announcing

The birth of AP5400:

**The world's most powerful multimedia notebook
full of features, for only:**

\$ 3195

\$ 2550

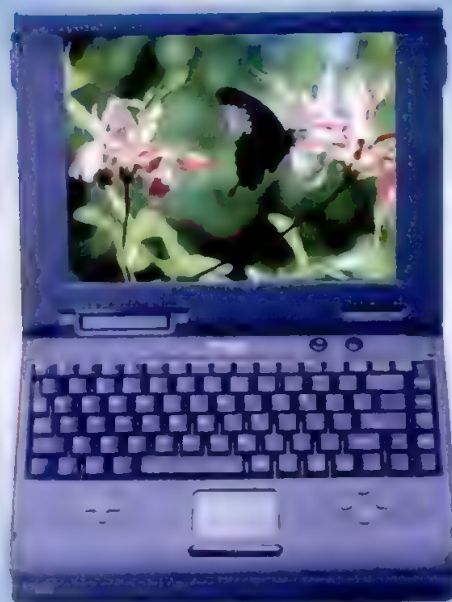


AP 7600

- Intel Pentium-90 MHz CPU (3.3V).
- VL bus Graphic Accelerator with 1MB VRAM.
- Two PCMCIA type II or one type III Slots.
- 8MB RAM expandable to 40MB.
- 256 KB Secondary Cache Memory.
- Removable 540 MB Hard Drive (810MB Option), local bus IDE interface.
- 3.5" 1.44 MB Floppy Drive.
- 16-bit Stereo Audio Card, Mic. and Speaker.
- 10.3" Dual Scan (9.5" and 10.4" Active Matrix Options. Add \$530 for 9.5" option).
- Built-in Trackball.
- Built-in Intelligent Power Manager (IPM).
- One 16C550 high speed Serial Port & one Parallel Port with ECP/EPP.
- Ports for Ext. keyboard, Ext. Monitor & 200 Pin Connector for Docking Station.
- Carrying Bag & A/C Adapter.
- 6.4 lbs (with Battery), 11"W x 9.0"D x 1.9"H.

Optional 3-Year Extended Warranty from General Electric

Lifetime Toll Free Technical Support, One year Parts and Labor Warranty, 30-Day Money Back Guarantee.



AP 5400

- Intel Pentium-90 MHz CPU.
- 64 bit 256k Write Back Secondary Cache Memory.
- 64 bit 8MB RAM expandable to 32MB.
- PCI bus Graphic Accelerator with 2MB Video RAM.
- 11.3" 800x600 Dual Scan (10.4" Active Matrix Option add \$380).
- Built-in 2X CD-ROM & 16 bit Stereo Sound Card.
- Two PCMCIA type II or one type III PCMCIA Slots.
- Removable 540MB HDD support PCI Enhance IDE. (810MB, 1.2 or 1.35 GB Option).
- Removable 1.44MB FDD can be replaced with MPEG Module.
- Built-in Touch Pad & Joy Stick.
- Infrared, Wireless "IR" Interface.
- 23 Watt NiMH Battery. A4 Size 86-Key Keyboard.
- 6.91 lbs (with Battery), 11.8"W x 8.9"D x 2.13"H.

Options:

- 28.8 or 57.6W Secondary Battery on Real Cover.
- AC Adapter by Battery Bay, Mini Docking Station.
- Video + PEG Module, CCD Camera Module, TV Tuner Module.

**We carry many other notebook models with
customization for your needs. Call for details.**

FOSA
Computer Inc.

1-800-216-3672

TEL: 908-753-6100 FAX: 908-753-6616
400 Corporate Court, #D, South Plainfield, NJ 07080
Hours: Mon-Fri. 9AM-6PM; Sat. 10AM-3PM

FOSA Computer Inc. All right reserved. All company and/or product names mentioned herein are trademarks and/or registered trademarks of their respective companies. Price and specification are subject to change without notice. Not responsible for typographic errors.

CIRCLE 069 ON READER SERVICE CARD

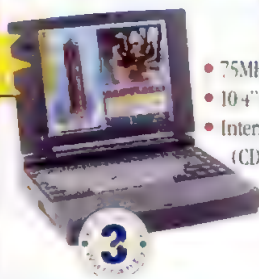
YOUR FIRST SOURCE FOR NOTEBOOK COMPUTERS!

Satellite Pro 2150CD T400 Series

- SoundBlaster Pro compatible sound support
- Built-in double speed CD-ROM drive
- Integrated AccuPoint Pointing Device
- VL Bus local bus video
- PC card Type III slot



New!



- 75MHz Pentium Processor
- 10.4" display
- Internal 4X CD-ROM (CDT version)
- Lithium Ion battery
- Built-in sound

New!

Portégé 610CT

- 90MHz Pentium Processor
- Lithium Ion Battery
- 9.5" true color display
- Built-in sound

New!



Model	Processor	Ram	Screen	Hard Drive	Price
T2100	486DX2/50	4MB	9.5" Mono	250MB	\$1,392
T2100CS	486DX2/50	4MB	10.4" Dual Scan	330MB	\$1,971
T2100CT	486DX2/50	8MB	8.4" Active	330MB	\$2,674
T2150CDS	486DX4/75	8MB	10.4" Dual Scan	500MB	\$3,058
T2150CDT	486DX4/75	8MB	10.4" Active	500MB	\$3,057
T4850CT	486DX4/75	8MB	10.4" Active	500MB	\$3,272
T4850CT	486DX4/75	8MB	10.4" Active	720MB	\$3,443

Model	Processor	Ram	Screen	Hard Drive	Price
T2150CS	486DX4/75	8MB	10.4" Dual Scan	500MB	\$2,559
T2150CT	486DX4/75	8MB	10.4" Active	500MB	\$3,016
T2450CT	486DX4/75	8MB	9.5" Active	320MB	\$3,102
T2450CT	486DX4/75	8MB	9.5" Active	500MB	\$3,187
T2110CS	486DX4/75	4MB	10.4" Dual Scan	320MB	\$2,209

Model	Processor	Ram	Screen	Hard Drive	Price
610CT	Pentium/90	8MB	9.5" Active	720MB	\$4,297
400CS	Pentium/75	8MB	10.4" Dual Scan	810MB	Call
400CT	Pentium/75	8MB	10.4" Active	810MB	Call
T4900CT	Pentium/75	8MB	10.4" Active	772MB	\$4,725

FST CARRIES MEMORY, DOCKING STATIONS, PC CARDS, EVERYTHING YOU NEED FOR YOUR NOTEBOOK!

TOSHIBA



ASCENTIA 950 NOTEBOOK



New!

- Pentium performance
- Built-in sound
- Infrared & PC card slot
- Lithium Ion battery



Model	Processor	Ram	Screen	HD	Price
810N	486DX2/66	4MB	10.4" Dual Scan	510MB	\$1,731
910N	486DX2/50	8MB	10.3" Dual Scan	340MB	\$2,420
910N	486DX4/75	8MB	10.3" Dual Scan	510MB	\$2,606
910N	486DX4/75	8MB	10.4" Active	510MB	\$3,630
910N	486DX4/75	8MB	10.4" Active	700MB	\$3,909
950N	Pentium/75	8MB	10.4" Dual Scan	500MB	\$3,258
950N	Pentium/75	8MB	10.4" Dual Scan	800MB	\$3,537
950N	Pentium/75	8MB	10.4" Dual Scan	1.2GB	\$4,003
950N	Pentium/75	8MB	10.4" Active	800MB	\$4,654
950N	Pentium/75	8MB	10.4" Active	1.2GB	\$5,120

TRAVELMATE 5000 PENTIUM NOTEBOOKS!

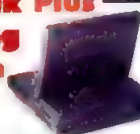
- Brilliant color display
- Built-in PCI Bus
- Built-in 16-bit Sound
- 2 Type II or 1 Type III PC card slot

TEXAS INSTRUMENTS



Pentium Power!

EZ-Dock Plus Docking Station



CALL FOR ANY NOTEBOOK COMPUTER NOT LISTED

NEC VERSA 2000

- Intel DX4™ 75MHz processor
- Brilliant color display
- VersaGlide pointing device
- Long lasting Lithium Ion battery



New!

NEC



Model	Processor	Ram	Screen	Hard Drive	Price
Versa 2000D	486DX4/75	4MB	10.4" Dual Scan	350MB	Call
Versa 2000C	486DX4/75	8MB	9.5" Active	350MB	Call
Versa 2000C	486DX4/75	4MB	9.5" Active	540MB	Call
Versa V	486DX2/50	4MB	9.5" Dual Scan	250MB	\$2,094
Versa V	486DX2/50	4MB	9.5" Active	250MB	\$2,233
Versa V	486DX2/50	4MB	9.5" Active	340MB	\$2,327
Versa V	486DX4/75	4MB	9.5" Active	540MB	\$2,199
Versa M	486DX4/75	8MB	9.5" Dual Scan	250MB	\$2,327
Versa M	486DX4/75	8MB	9.5" Dual Scan	340MB	\$2,420
Versa M	486DX4/75	8MB	9.5" Active	340MB	\$2,699
Versa M	486DX4/75	8MB	9.5" True Color	340MB	\$2,199
Versa M	486DX4/75	8MB	9.5" High Res.	540MB	\$3,165
Versa M	486DX4/100	8MB	9.5" Active	340MB	\$3,351
Versa M	486DX4/100	8MB	9.5" True Color	540MB	\$3,351
Versa M	486DX4/100	8MB	9.5" Active	810MB	\$4,003
Versa M	486DX4/100	8MB	9.5" High Res.	540MB	\$3,816
Versa M	486DX4/100	8MB	9.5" High Res.	810MB	\$4,189
Versa P	Pentium/75	8MB	9.5" Active	340MB	\$4,003
Versa P	Pentium/75	8MB	9.5" Active	540MB	\$4,282
Versa P	Pentium/75	8MB	9.5" Active	810MB	\$4,654
Versa P	Pentium/75	8MB	9.5" High Res.	540MB	\$4,468
Versa P	Pentium/75	8MB	9.5" High Res.	810MB	\$4,840
Versa P	Pentium/75	8MB	10.4" Active	540MB	\$4,561
Versa P	Pentium/75	8MB	10.4" Active	810MB	\$4,934
Versa P	Pentium/75	8MB	10.4" High Res.	810MB	\$5,120

Windows® 95

\$89.95

100 percent of all new products remain upgrade

Windows® 95

\$45

Upgrade Version

Windows® 95

\$331

Upgrade Version

Windows® 95

\$99

Upgrade Version

Windows® 95

\$99

Upgrade Version

Windows® 95

\$99

Upgrade Version

Windows® 95

\$99

Upgrade Version

JAZZ MULTIMEDIA

Jakarta MPEG Video Graphics Accelerator

SPECIAL OFFER!
Jakarta Entry Bundle \$1444

The Jakarta MPEG Video Graphics Accelerator is a high performance 2MB graphics accelerator with built-in MPEG-1 and MPEG-2 video processing capabilities. It is compatible with all major video cards and provides excellent performance for all video applications. Jakarta delivers full motion video at 29.97 FPS.

Jakarta MVGA

16-bit, 256K, 16.7M, 2MB, VLB or PCI	\$371
16-bit, 256K, 16.7M, 2MB, VLB or PCI	\$133
16-bit, 256K, 16.7M, 2MB, VLB or PCI	\$109

CYRIX

386 TO 486 PROCESSOR UPGRADES

The Answer to High Performance, Compatible & Economical 386 Upgradability!

FREE

Cyrix

- 2X Clock Multiplier
- On-Chip 1-KByte Data Cache
- Cache Coherency
- Single Chip Form Factor
- Clock Duty Cycle Correction
- Single-Cycle Execution
- Low-Cost Floating-Point Option

Cx486DX2-25/50	\$187
Cx486SBC2-25/50	\$187
Cx486DX2-33/66	\$187

New INTEL Pentium OverDrive

OverDrive Processors

With Intel OverDrive™ processors, you can afford to upgrade.

\$10 Instant Rebate
When purchased with a 4th or greater memory upgrade.

OverDrive processors are available in a range of price/performance options. Boost your software's speed in any PC operating system: Windows™, MS-DOS, OS/2 and Unix.

Overdrive 486DX2/50	\$117
Overdrive 486DX2/66	\$139
Overdrive 486DX4/75	\$170
Overdrive 486DX4/100	\$254
Overdrive Pentium-65, 65MHz	\$370

To find out which OverDrive processor is right for you, call us.

MICROSOFT

Windows 3.11

\$89.95

Other software titles designed for Windows® 95

Microsoft Plus 1.0	\$45
Upgrade Office Standard	\$233
Upgrade Office Professional	\$327
Upd Office Prof w/ Bookshelf	\$331
Upgrade Word	\$99
Upgrade Excel	\$99
Upgrade Access	\$99
Upgrade Power Point	\$99

PROCESSOR UPGRADES

Kingston

Lightning 486™ Processor Upgrade (Upgrades most 586/486, 16, 20, 25, or 33MHz systems) \$239

TurboChip Processor Upgrade 75MHz (Upgrades most 486/486, 16, 20, 25, or 33MHz systems) \$269

Adaptec

Lightning 486™ Processor Upgrade (Upgrades most 586/486, 16, 20, 25, or 33MHz systems) \$239

TurboChip Processor Upgrade 75MHz (Upgrades most 486/486, 16, 20, 25, or 33MHz systems) \$269

PC CREDIT CARDS

NewMedia

Multimedia Combo: Sound and SCSI card \$119

WVJammer Sound card \$224

BUS Taster SCSI card \$190

Smart Module Tech

14.4 Fax/Modem with Voice Mail \$139

Adaptec

APA 1440 SCSI 2 Kit with EZSCSI software \$205

Qlogic

FATSCSI PCMCIA-30 with CardSCSI software \$185

AT&T

Keep In Touch 14.4 Cellular, Connects directly to cellular phone \$209

Megahertz

Ethernet Adapter with XJACK™ 10Base-T \$149

Ethernet Adapter with XJACK™ 10Base-T & 10Base-2 cable \$169

Socket

Serial I/O Adapter with 16550 \$139

Parallel PCMCIA wireless messaging \$329

Kingston

26MB Type III Hard Disk Drive \$499

US Robotics

Spider 14,400 PCMCIA 2.1, V.34 bis with V.42 bis \$181

Spider 28,800 PCMCIA 2.1, V.34 bis with V.42 bis \$362

NETWORKING

3COM

Etherlink 11B, ISA 16-bit, 10Base-T \$107

Etherlink 11B, PCMCIA Combo \$209

Intel

EtherExpress PRO/10 Adapter, ISA 16-bit, 10Base-T, Thick \$99

EtherExpress PRO/100 PCI 32-bit, 10Base-T \$219

CALL FOR MULTIPLE PACKS

Xircom

Pocket Ethernet III, 10Base-T, RJ45 \$272

Pocket Ethernet III, 10Base-T, 10Base-2 \$311

CreditCard PCMCIA Ethernet Modem Combo \$451

CreditCard PCMCIA 10/5 Ethernet 10Base-T \$155

FIRST SOURCE OFFERS OVER 20,000 NAME BRAND HARDWARE & SOFTWARE PRODUCTS AT DISCOUNT PRICES!

US ROBOTICS

Sportster® Vi Faxmodem with Personal Voice Mail!

Available in 14.4 or 28.8

NEW!

Your personal office message center!

- Provide business-quality voice mail with multiple mailbox
- Retrieve fax and voice messages from remote location
- Transmit data files during regular voice calls

Sportster 21, 14.4, Int/Ext	\$89/\$85
Sportster 14.4, Int/Ext	\$97/\$113
Sportster Vi, 14.4, Int/Ext	\$119/\$139
Sportster 28.8, V.34, Int/Ext	\$229/\$246
Sportster Vi 28.8, V.34, Int/Ext	\$249/\$259

MEGAHERTZ

28.8bps PCMCIA Fax/Modem with XJACK®

Megahertz newest PCMCIA Fax Modem with XJACK® features the V.34 standard for high-speed access, 28,800 bps - the fastest standard speed available!

FREE Spy's Mosaic In A Box internet software start-up kit & a 12 month gift subscription to Internet World!

XJACK® 28.8 Fax/Modem V.34 MNP5	\$329
Combo Fax/Modem - Ethernet 14.4, 10Base-T	\$379
XJACK® 14.4 Fax/Modem	\$169

VIEWSONIC

17GA 17" MONITOR Perfect Sound™ Multimedia Ready

- High fidelity, dome speakers built into the bezel
- Microphone, head phone jack and external microphone port
- OnView™ controls for adjusting screen images and audio
- Plug & Play Windows® 95

15G 17" Monitor 1280x1024 NL, 60Hz, 26dpi	\$415
17GS 17" Monitor 1280x1024 NL, 86Hz, 27dpi	\$772
17GA 17" Monitor with speakers 1280x1024 NL, 86Hz, 27dpi	\$859
20G 20" Monitor 1600x1280 NL, 60Hz, 28dpi	\$1,318

All monitors are EPA-E & EPA Energy Star™ compliant

REMOVABLE DRIVES

The Ultimate in Storage Technology!

- Provides unlimited storage capacity.
- Perform backup faster than tape.
- Organize data easily and allow easy data transportability
- Provide data security.

Internal IDE Drive

270MB, 13.5ms, 3.5"	\$394
---------------------	-------

External SCSI Drives

88MB, 20ms, 5.25"	\$285
200MB, 18ms, 5.25"	\$415
270MB, 13ms, 3.5"	\$415

Cartridges

88MB, 20ms, 5.25"	\$49
200MB, 18ms, 5.25"	\$72
270MB, 13ms, 3.5"	\$59

CONTROLLERS

Adaptec

Total CDAV 1595 \$49

Mini Converter AIA 1515 \$85

AIA-1542 CF, ISA 16-bit, SCSI2, floppy \$205

AIA-2940 Kit, PCI, Fast SCSI2, no floppy \$302

Portable System Solutions

SCSI Cable Plus... connect to printer port \$149

Future Domain

Enhanced IDE for ISA \$49 Enhanced IDE for VLB \$79

CMD Technology

Enhanced IDE for PCI \$99

MONITORS

ADI

MicroScan 4GP 15" 28dpi, 60Hz, MPRII \$151

MicroScan SEP 17" 28dpi, 60Hz, MPRII \$632

ViewSonic

15G 15" 28dpi, NL, MPRII, Energy \$415

17GA 17" 28dpi, NL, MPRII, Energy, Sound \$859

20G 20" 28dpi, NL, MPRII, Energy \$1,318

NEC

2014 14" 28dpi, NL, MPRII, Energy \$319

2015 15" 28dpi, NL, MPRII, Energy \$445

2017 17" 28dpi, NL, MPRII, Energy \$779

HARD DRIVES

Maxtor

540MB 7500V, 3.5" LP, IDE, 14MS \$202

850MB 7500V, 3.5" LP, IDE, 12MS \$257

Quantum

560MB Lightning 365, 3.5" LP, IDE, 11MS \$195

540MB Lightning 365, 3.5" LP, IDE, 14MS \$195

750MB Lightning 365, 3.5" LP, IDE, 11MS \$235

Western Digital

540MB AC2540, 3.5" E-IDE, 11MS \$267

850MB AC2700, 3.5" E-IDE, 10MS \$256

1080B AC3100, 3.5" E-IDE, 10MS \$267

1280B AC3100, 3.5" E-IDE, 10MS \$295

TAPE BACK-UPS

MicroSolutions

BackPack 250MB, Ext. Hooks to printer port \$264

BackPack 500MB, Ext. Hooks to printer port \$396

Colorado Memory Systems

Junior 250MB, Int. Hooks to software \$133

Tracker 250MB, Ext. Hooks to printer port \$264

Tracker 500MB, Ext. Hooks to printer port \$329

Tracker 700MB, Ext. Hooks to printer port \$395

Imago

Orbit 250, 250MB, Int. Install kit and software \$100

Orbit 250, 250MB, Ext. Hooks to printer port \$200

MAIL OR FAX ORDERS TO:
(714) 448-7750 • FAX: (714) 448-7760
Compuserve Address: MHS.SALES@1SOURCE
First Source International
7 Journey • Aliso Viejo, California 92656

Call the Upgrade Experts

ORDER NOW

800-270-9866

International Orders Call 714-448-7750

CIRCLE 014 ON READER SERVICE CARD



HOURS
Monday - Friday • 7am - 5pm, PST
Saturday, 9am - 3pm (orders only)

WINDOWS® 95 FACT

^{***}Windows Sources Magazine, April 1995

#10

LASER PRINTER MEMORY

Canon LBP-4			
1MB n/a	\$109	2MB n/a	\$134
Canon LBP-XII, IIR, J17			
2MB	\$63, 1880		\$119
Epson ActionLaser 1000, 1500			
512K n/a	\$35	2MB n/a	\$99
Epson ActionLaser 1100			
2MB n/a	\$99	4MB n/a	\$159
Epson ActionLaser 1600			
4MB n/a	\$159	16MB n/a	\$609
HP LaserJet si			
1MB	C2042A		\$44
HP LaserJet IIP, III, IIR, IIIR			
2MB 33475B	\$95	4MB 33477B	\$169
HP LaserJet II, IID			
2MB 33444B	\$95	4MB 33445B	\$109
HP LaserJet IISi, 4, 4M, 4L, 4S, 4SX, XL300, Desktop 1200			
1MB C2064A	\$48	2MB C2064A	\$89
4MB C2064A	\$169	8MB C2066A	\$349
HP LaserJet 4P, 4MP, Color LaserJet			
2MB C3151A	\$95	4MB C3152A	\$170
HP Desktop 500, 500K, 520, 520K, 550K, 560, 560K, 254K			
	22707B		\$40
HP LaserJet SP, SMP			
4MB C3152A	\$170	8MB C3153A	\$329
IBM/Lexmark Laser 4019 (all models)			
2MB 1098675	\$107	3.5MB 1099157	\$167
IBM/Lexmark Laser 4029 (all models)			
2MB 1185334	\$87	4MB 1185335	\$157
IBM/Lexmark Laser 4039, 4047 (all models)			
4MB 1329564	\$157	8MB 1329565	\$319
Okidata Laser 400			
1MB 70014701	\$69	2MB n/a	\$97
Okidata Laser 400e, 410e			
2MB n/a	\$117	4MB n/a	\$197
Okidata 830, 830 Plus, 840			
2MB n/a	\$124	4MB n/a	\$209
Panasonic LaserPartner 4400, 5400			
2MB AX-PEM1	\$110	4MB KX-PEM2	\$204
Panasonic LaserPartner 4410, 4430			
2MB KX-P444	\$115	4MB n/a	\$196
Panasonic LaserPartner 4450, 4420			
2MB KX-P441	\$116	4MB n/a	\$187
Texas Instruments MicroLaser, XL			
1MB	2555749-0001		\$29

FSI Stacks Cache
Plans for RM Systems

PERSONAL COMPUTER MEMORY

AST

Premima GX P/100, P/90					
8MB	501565-001	\$309	16MB	501566-001	\$609
32MB	501567-001	\$1,007	64MB	501568-001	\$1,999
Premima MTE, SE P/60					
4MB	501159-001	\$190	8MB	501159-002	\$357
16MB	501159-003	\$712	32MB	501159-004	\$1,220
Bravo 386-SX, WS/286, 386					
2MB	500510-002	\$80	4MB	500510-008	\$195
Bravo 3/25					
2MB	500710-004	\$89	8MB	500824-002	\$306
Advantage/35 486SX/33, DX2-50, DX2-66					
4MB	501168-001	\$158	8MB	500824-001	\$329
Advantage/35 Advantage/36 386SX/25, Bravo 3/33					
2MB	500962-001	\$80			
8MB	500962-002	\$173			
Advantage/36 486SX/33, SX/25					
Bravo LC, LC II, LP and MT					
256K Cache					
1MB Video (pgl)	501507-001	\$69			
4MB	500987-002	\$151			
16MB	500987-004	\$518			
32MB	500987-005	\$1,089			
Premium 386/25, 33, 33T and Premium II 386SX/16, 20, 25					
1MB	500780-003, 002	\$45			
Premium 386/33T, 386SX/16 and Premium II 386SX/20, 25					
4MB	500780-004	\$188			
Advantage/486/25, 33, 33p, SX/20, Premium Server SE 4/33					
Power Premium and Premium TE all models					
Premium II 386/25, 33, 486/33, 486SX/20					
2MB	500780-001	\$28			

COMPAQ

Presario 500, 700 and 900 series			
4MB	147522-001	\$159	8MB 147523-001 \$307
16MB	147524-001	\$549	32MB 147525-001 \$1019
ProLiant 2000 and 4000 series, SystemPro XL			
16MB	149949-001	\$709	32MB 149912-001 \$1426
64MB	149913-001	\$2436	128M 149914-001 \$4595
ProLiant 3/25, 3/25S			
2MB	141739-001		\$89
8MB	141742-001		\$304
Presario 600 and 800 series, ProLiant 4/25, 4/33, 4/50, 4/66			
SystemPro MT and ProLiant Enhanced series, ProSignia VS			
2MB	141683-001		\$95
4MB	141684-001		\$153
8MB	141685-001		\$307
DeskPro 396-20, 25, 385-20, 25e			
1MB Module	113131-001		\$62
4MB Module	113132-001		\$167
DeskPro 386/16			
1MB Module	113646-001		\$62
4MB Module	112534-001		\$194
4MB Board	116344-001		\$287
DeskPro 3/25i, 33i, 4/25iS, 33i, 66i, 286i, 386i, SX/20, 20i			
SystemPro LT and M Series			
1MB	118688-001	\$49	2MB 118689-001 \$95
4MB	118690-001	\$153	8MB 118877-001 \$356
ProSignia PC Server 4063S, D2X66			
16MB	149320-001	\$610	32MB 149147-001 \$1152
DeskPro 386-33, 486-33, SystemPro and SystemPro E series			
2MB	115144-001	\$109	8MB 115651-001 \$376

STANDARD SIMMS

30-PIN

1 x 3-70ns (3-chip/1MB)...	\$34. ⁹⁵
1 x 9-70ns (1MB)	\$35. ⁹⁵
4 x 9-70ns (4MB)	\$124. ⁹⁵
16 x 9-70ns (16MB)	\$559. ⁹⁵

72-PIN

512 x 36-70ns (2MB).....	\$92
1 x 36-70ns (4MB).....	\$134
2 x 36-70ns (8MB).....	\$289
4 x 36-70ns (16MB).....	\$494

**First Source
International
Always
Includes
Installation
Instructions**

ALWAYS CALL FSI BEFORE YOU BUY!

DELL

Optiplex ME and V models, PowerEdge XE models				
Performance L, M and Y models				
4MB	310-3325	\$151	16MB 310-3327	\$525
Power Desktop and Low Profile Power Desktop models				
1MB	310-2505	\$49		
2MB	310-2507	\$151		
16MB	310-2625	\$575		
PowerLine Workstation DE and SE models				
2MB	310-2466	\$99	4MB 310-2467	\$190
8MB	310-2468	\$305	16MB 310-2469	\$712
Performance ME models				
8MB	310-3335	\$305	32MB 310-3337	\$1220

HEWLETT-PACKARD

Vaccinia VLP, XP, XI*, M2, N2 and J3M2 models			
Netweter LM, LC and LF models			
4MB	D2974A	\$179	8MB D2975A \$356
16MB	D2978A	\$609	32MB D2298A \$1152
Vaccinia QS and RS models			
4MB	D1542 or 1642A		\$177
8MB	586/166, 20N, 25N models		
2MB	D2406A	\$89	8MB D2404A \$305
Vaccinia v46 M, M1, N, N1 and XN models			
2MB	D2381A	\$95	8MB D2352A \$305
4MB	D21256A	\$151	16MB D12676A \$611
8MB	586/25 486/251, 33*, 33ST, 50*, 66* and 66ST		
2MB	D2381A	\$95	8MB D22715A \$357
Vaccinia 586/33N, N1 models			
2MB	D2714A	\$92	8MB D2715A \$304

IBM

■ Aptiva 300, 500 and 700 series		
4MB	n/a	\$159
16MB	n/a	\$509
■ Edquest 55		
4MB		\$174
4MB	74G1299	
■ Edquest 30, 40 and 50 models		
4MB	60G0896	\$549
16MB	60G0898	\$549
PS/1 286, 386SX		
2MB	92F9935	\$163
4MB	92F9694	\$163
Valuepoint Performance models		
4MB	92G2091 or 73G3131	\$179
8MB	92G7520 or 73G3132	\$354
PS/1 Consultant, Essential, Expert models 283, 344		
PS/Valuepoint all models except Cxx models		
4MB	96F9290	\$609
16MB	96F9291	\$609
PS/1 Consultant, Essential, Expert models		
16MB	96F9291	\$609
PS/2 25/286, 30/286		
2MB	30F3660	\$79
PS/2 35SX, LS, 40SX, 50, 55SX, LS, 65SX, LS, 70Station		
2MB	64G0604	\$87
PS/2 70-A21, A61, B21, B61, PS/Valuepoint Cxx models		
PS/1 Consultant, Essential, Expert models		
2MB	64G0608	\$95
PS/2 35SX, LS, 40SX, 55SX, LS, 65SX, LS, 70Station		
PS/Valuepoint Cxx models		
4MB	34F2933 or 87F9477	\$179

\$6 FedEx
Economy
Two-Day
Service
Up to 3lbs.
FedEx
Federal Express

IBM. Continued

PS/2 35XX, LS, 40XX, PS/Valuepoint	
8MB	6450129
PS/2 90 XP, 95, KP, P75 (pairs) 56, 57 (all) PS1 Pro M2123	\$356
8MB	6450902
PS/2 90 XP, 95, KP, P75 (pairs) 56, 57 (all models)	\$85
PS/1 Consultant, Essential, Expert models, PS/1 Pro M2123	
4MB	6450128
8MB	6450130
PS/2 80-111; 111; 121; 321; 081; 161	\$356
2MB	6450579
PS/2 80-A21; A31; A16	\$88
4MB	6451060
Expansion boards for PS/2 80286 based models	\$193
4-16MB w/4MB	6450609 (use 72-pin)
Expansion boards for PS/2 386 based models	\$299
2-14MB w/2MB	3437037 (use 72-pin)
4-16MB w/4MB	3437011 (use 72-pin)
	\$205
	\$299

NEC

Image 425, 433, 466, PowerMate V series			
4MB	410-2002	\$147	16MB 410-2003 \$556
Ready 425, 433			
4MB	n/a	\$147	16MB n/a \$556
PowerMate 386/33i Express E models			
4MB	0P410-6205	\$176	16MB 0P410-6206 \$610
PowerMate 286/12 SX/16, SX/20			
2MB	0P-410-8103		\$89
PowerMate 386SX/20i; 16; 25i; 486/50i; 33i			
8MB	0P-410-2101		\$304
PowerMate SX Plus			
2MB Board	n/a		\$163
4MB Board	n/a		\$278
PowerMate SX/20			
2MB CPU Upgrade	0P-410-8101		\$151
2MB Board	0P-410-8102+8103		\$171
PowerMate 386/20 25			
2MB	APC-H655	\$219	8MB APC-H656 \$599
PowerMate 386/33E, 486/25E			
2MB	0P-410-5101		\$171

ZENITH

Z-400+ Z-Station SEH, SEN, Sh, Sn, DEH, Dh and Xen				
Z-400/400 Series, Z-420/5X, Z-425/5X, Z-433/1X, 5X				
16MB	ME-100		\$179	
4MB	ME-90		\$610	
Z-Station models				
1MB	ME-70		\$49	
4MB	ME-100		\$179	
Z-Select 100 models				
4MB	AME-0070	\$179	8MB AME-0073	\$354
Zenthix Z-386/20; 25; 33; 33SE				
1MB	ZA3800ME		\$49	
4MB	ZA3800MK		\$179	
Zenthix Z-386SX/16 and Z-386SX/20				
2MB	Z-605-1		\$69	
Z-Server EX and LT models				
8MB	ME-432		\$359	
16MB	ME-102		\$610	
32MB	ME-442		\$1220	
64MB	ME-92		\$249	
Zenthix 486/33ET				
4MB	ZA420-M2	\$190	16MB ZA420-M8	\$713

FOR MEMORY, ALL YOU NEED TO KNOW IS THE NAME OF YOUR PC!

Our upgrade experts have detailed configuration information on thousands of computers and printers, from the oldest to the latest models.

We provide you with an "Easy Upgrade" by providing you with the following information:

- ✔ Your System Memory Features ✔ How Much Memory You Really Need ✔ Memory Products Available for Your System
✔ The Most Cost Effective Upgrade Path for Your System ✔ Your Systems Minimum and Maximum Memory Capabilities

First Source International takes the confusion out of your memory purchase.

Take advantage of our service and the savings!



LAPTOP AND NOTEBOOK MEMORY

AST

Ascentia 800N, 810N	4MB	\$189
	8MB	\$359
	16MB	\$699
Ascentia 900N, 910N	4MB	\$192
	8MB	\$359
	16MB	\$699
Ascentia 950N	8MB	Call
	16MB	Call

COMPAQ

Compaq Elite	4MB	\$189
	8MB	\$359
	16MB	\$699
Contura 410	4MB	\$185
	8MB	\$359
	16MB	\$699
Contura 4/25	4MB	\$179
	8MB	\$339
	16MB	\$659
Contura Aero	4MB	\$185
	8MB	\$359
	16MB	\$659

Digital

Hi-Note	4MB	\$179
	8MB	\$349
	16MB	\$619
Hi-Note Ultra	4MB	\$179
	8MB	\$349
	16MB	\$619

IBM

ThinkPad 360	4MB	\$189
	8MB	\$359
	16MB	\$699
	32MB	\$1,379
ThinkPad 701	4MB	\$189
	8MB	\$379
	16MB	\$659
	32MB	\$1,379
ThinkPad 750	4MB	\$189
	8MB	\$359
	16MB	\$659
ThinkPad 755	4MB	\$199
	8MB	\$389
	16MB	\$679
	32MB	\$1,379

ThinkPad 700, 720 and C157SX

4MB	\$199
8MB	\$339
16MB	\$669
32MB	\$1,399
4MB	\$179
8MB	\$315
16MB	\$619

ThinkPad 710T

NSI Notebook

4MB	\$179
-----	-------

WHY ADD MORE MEMORY?



Microsoft® Windows® 95

"We recommend 16MB of RAM (for Windows® 95), particularly if you plan to run multiple applications."
... PC Magazine, May 16, 1995

"Memory has a bigger impact on Windows® 95's performance than any other single component. If you don't have at least 16MB of RAM, prepare to upgrade."
... Windows Sources Magazine, April 1995

NEC

Versa 2000	4MB	\$189
	8MB	\$369
	16MB	\$659
	32MB	\$1,379
Versa S	4MB	\$179
	8MB	\$359
	16MB	\$619
	32MB	\$1,379
Versa V, M, P	4MB	\$189
	8MB	\$359
	16MB	\$619
	32MB	\$1,379

Texas Instruments

TravelMate 4000M, 4000E	4MB	\$189
	16MB	\$799
	32MB	\$1,499
TravelMate 5000	16MB	\$1,399

Toshiba

T2100, T2110, T2130, T2150	4MB	\$172
	8MB	\$335
	16MB	\$679
	24MB	\$999
T1900, T4500, T4600, T4700, T4800, T4850, T4900	4MB (3.3 V)	\$189
	8MB (3.3 V)	\$359
	16MB (3.3 V)	\$699
	32MB	\$1,379
T3400, T3600	4MB	\$189
	8MB	\$349
	16MB	\$679
T400	8MB	Call
T610 Portage	16MB	Call
	32MB	Call
T3300SL	4MB	\$165
	8MB	\$339
T4400, T5400 (all models)	4MB	\$179
	8MB	\$339
	16MB	\$675
T5400, T5200, T5200C, T8500	2MB	\$87
	8MB	\$347

Zenith

Z-Note Flex	4MB	\$179
	8MB	\$339
	16MB	\$699
Z-Star	4MB	\$199
	16MB	\$699

CALL FOR ANY MEMORY UPGRADE NOT LISTED

We stock memory upgrades for thousands of computers & printers

FIRST SOURCE OFFERS OVER 20,000 NAME BRAND HARDWARE & SOFTWARE PRODUCTS AT DISCOUNT PRICES!

CD-ROM DRIVES

NEC	2X DRIVES
MultiSpin 2V1, Internal, 330ms, 800MB, IDE, with controller	\$175
Media Vision	
Reno MV-400 External, 100ms, 350MB, SCSI, with controller	\$281
Panasonic	
KD-LD720 Portable, 2X, 250ms, 300MB, w/PCMCIA controller	\$299
Toshiba	
XM3501B 5-4X, Internal, 150ms, 600MB, SCSI, without controller	\$119
XM3501E 5-4X, External, 150ms, 600MB, SCSI, without controller	\$149
Plexter	
4PLEX, Internal, 170ms, 600MB, SCSI, 256KB buffer, without controller	\$304
4PLEX, External, 170ms, 600MB, SCSI, 256KB buffer, without controller	\$346
NEC	
MultiSpin 4X1, Internal, 220ms, 600MB, SCSI, without controller	\$392
MultiSpin 4X2, External, 220ms, 600MB, SCSI, without controller	\$490
Plexter	
6PLEX, Internal, 145ms, 900MB, SCSI, 256KB buffer, without controller	\$472

PRINTERS

Canon	
LabelWriter XL Thermo Label Printer, Windows	\$149
LabelWriter XL Plus Thermo Label Printer, Windows	\$349
Digital	
DEWriter 1100 Inkjet	\$236
DEWriter 900 Inkjet with COLOR	\$299
DEWriter 900 Portable Inkjet	\$270
DEWriter 1800, 6ppm, 300dpi	\$677
DEWriter 3500, 12ppm, 600dpi	\$1698
DEWriter 5100, 9ppm, 600dpi	\$1136
Epson	
Stylus Color Inkjet, 200dpi, 720dpi	\$930
ActionLaser 1100, 4ppm, 300dpi, 1MB	\$982
ActionLaser 1400, 4ppm, 600dpi, 2MB	\$1477
Hewlett-Packard	
LaserJet 4L, 4ppm, 300dpi, 1MB	\$526
LaserJet 4ML, 4ppm, 300dpi, 4MB	\$1036
LaserJet 5MP, 6ppm, 600dpi, 5MB	\$1053
LaserJet 5P, 6ppm, 600dpi, 2MB	\$988
LaserJet 4V, 15ppm, 600dpi, 4MB	\$2017
DeskJet 540, Monochrome Inkjet	\$295
DeskJet 1300 Color Inkjet, 600 x 300dpi	\$1015
IBM Lexmark	
WinWriter 150 c Inkjet	\$576
WinWriter 400 Laser, 5ppm	\$749
WinWriter 600 Laser, 600dpi, 2MB	\$993
NEC	
SuperScript Color 3000, 1ppm, Photo Quality	\$999
SuperScript 650 Laser, 6ppm, 600dpi	\$562
SuperScript 600 Laser, 6ppm, 600dpi	\$751
Olivetti	
OL4000 4ppm, 5MB, 300dpi	\$410
OL4100 4ppm, 2MB, 600dpi	\$530
Texas Instruments	
MicroWriter Basic, 5ppm, 5MB, 300dpi	\$464
MicroWriter PS23, 5ppm, 2MB, 300dpi	\$615
MicroLaser 600, 5ppm, 600dpi, 6MB	\$943
MicroLaser Pro PS23, 5ppm, 600dpi, 5MB	\$1180
MicroLaser Power Pro, 12ppm, 600dpi, 3MB	\$1685

PROCESSORS

Cyrix 586 to 486 Upgrades	
Cx486SDX2 25/50	\$187
Cx486SDX2 25/50	\$187
Cx486SDX2-33/66	\$187
Intel 486 SDX/DX to 486SDX2, DX4 or Pentium Upgrades	
OverDrive DX2/50	\$117
OverDrive DX2/66	\$139
OverDrive DX4/75	\$170
OverDrive DX4/100	\$254
OverDrive Pentium-65	\$370
Kingston 386 DX to 486 Upgrades	
Lightning 486	\$329
486 SDX/DX to 486 DX4 Upgrades	
Turbo Chip 75MHz	\$199
Turbo Chip 100MHz	\$269

VIDEO CARDS

Jazz Multimedia	
Jakarta 2MB, 1280x1024x1, 75Hz, MPEG Playback	\$371
Jakarta & Port of Entry Bundle	\$444
Port of Entry - TV Tuner option	\$133
Projector VGA to NTSC option	\$109
486 SDX/DX to 486 DX4 Upgrades	
Graphics Xpression 2MB, 70Hz, ISA, VLB or PCI	\$187
WinTurbo 2MB, 100Hz, ISA, VLB or PCI	\$270
Graphics Pro Turbo 2MB, 90Hz, ISA, VLB or PCI	\$318
Stealth 64 1MB, 75Hz, VLB/PCI DRAM, w/Color 3.0	\$150
Stealth 64 2MB, 75Hz, VLB/PCI DRAM, w/Color 3.0	\$202
Stealth 64 2MB, 120Hz, VLB/PCI VRAM, w/Color 3.0	\$240
Stealth 64 4MB, 120Hz, VLB/PCI VRAM, w/Color 3.0	\$499
SpeedStar 64 1MB, 72Hz, ISA/PCI	\$150
SpeedStar 64 2MB, 72Hz, ISA/PCI	\$202

CALL NOW FOR YOUR FREE CATALOG!



CIRCLE 272 ON READER SERVICE CARD

OVER 5,000 SOFTWARE TITLES AVAILABLE!

MAIL OR FAX ORDERS TO:
(714) 448-7750 • FAX: (714) 448-7760
Compuserve Address: MHS:SALES@1SOURCE
First Source International
7 Journey • Aliso Viejo, California 92656



HOURS

Monday - Friday • 7am - 5pm, PST
Saturday, 9am - 3pm (orders only)

Call the Upgrade Experts ORDER NOW 800-270-9866

International Orders Call 714-448-7750





COMPUTER DISCOUNT WAREHOUSE™

CDW® is your Windows® 95 specialist!

Microsoft® Windows 95 32-bit operating system

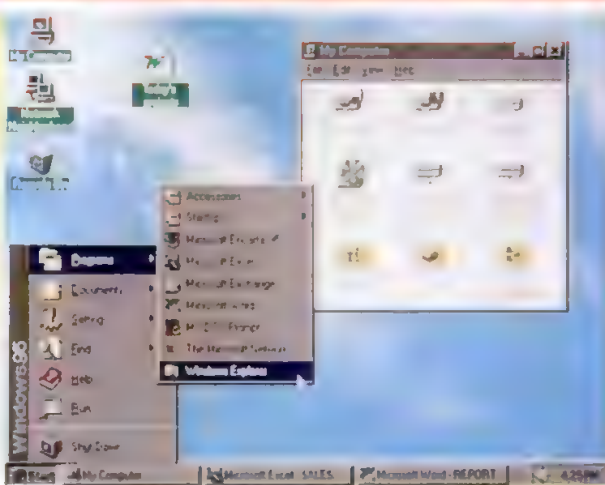
Unlock the potential of your PC

For years, millions of people worldwide have relied on MS-DOS®, Windows® and Windows® for Workgroups operating systems to help them work better and accomplish more. Now, even more people will go even farther with the next generation successor to these systems—Microsoft® Windows® 95. For computer users everywhere, it's a giant leap forward.



With Windows 95, the things you do now are easier and faster. The things you've always wanted try, from multimedia installations to Internet connections, are simple. Windows 95 makes computers more friendly and accessible, so whatever you do, you'll enjoy it more.

As low as
\$89.95!



Reserve your copy today!
Place your order now
for delivery beginning
August 24th.

***FREE overnight shipping**
when you make your
purchase with the
American Express® Card.



Windows 95 upgrade, 3.5"

\$89.95*

CDW 55562

Windows 95 upgrade, CD

CDW 55561

Windows 95, 3.5"

\$179.85

CDW 55565

Windows 95, CD

CDW 55584

Call CDW today for license information

Minimum system requirements: 386DX CPU, 4MB RAM (8MB recommended), 35-50MB hard disk space, VGA-compatible graphics adapter and monitor. Microsoft Exchange and The Microsoft Network (MSN) require 8MB RAM and 20MB of additional hard disk space (MSN also requires a modem). Full benefits of preemptive multitasking requires exclusive use of 32-bit Windows-based programs, such as products bearing the Designed for Windows 95 logo.

Microsoft Office® for Windows 95

Get your work done
efficiently and effectively

With Microsoft Office for Windows 95, you get the latest versions of Microsoft's fast, easy to use business applications:

Office Standard • Word • Excel • PowerPoint • Schedule+

Upgrade, 3.5"



FREE!
Field Guide to
Windows 95*

\$221.00*

CDW 55516

Upgrade, CD

CDW 55504

3.5"

\$442.92*

CDW 55583

CD

CDW 55565

*Free Microsoft Press Field Guide to Windows 95 with purchase of qualifying Office for Windows 95 products. Offer available only to first 10,000 customers purchasing a qualifying product.

Microsoft Plus!® for Windows 95

Packed with features that
complement Windows 95

- System Agent makes your PC virtually self-maintaining
- DriveSpace™ allows up to 50% more disk compression
- Themes wake up your desktop with 11 unique desktop environments
- Internet connect to the Information Superhighway with just a click (access fees apply after trial period)
- Pinball a 3-D Arcade game designed for Windows 95
- Dial-up Networking Server lets your small office or workgroup share data and e-mail remotely
- Font Smoothing makes fonts easier to read



3.5"

\$45.53

CDW 55567

CD

CDW 55561

**If You Find a Better
Price, Call CDW®
Before You Buy!**

CDW® Sells for Less and Services You Better!

(800) 326-4CDW

PCM 1322

©1995 CDW Computer Centers, Inc.

**IF YOU DON'T SEE IT...
CALL!**

COMPUTER DISCOUNT WAREHOUSE

High volume bids welcome



COMPUTER DISCOUNT WAREHOUSE

CDW® IS YOUR BEST CHOICE

COMPUTER DISCOUNT WAREHOUSE



TOSHIBA

Toshiba T2130 Series

75MHz performance, expandability and value!

- ◆ IntelDX4™ 75MHz CPU ◆ 8MB RAM, 600MB hard drive ◆ 10.4" active matrix color display
- ◆ Integrated AccuPoint™ pointing device ◆ Accelerated local bus video
- ◆ Internal AC adapter, no bulky "brick" required ◆ Call for additional details

T2130CS **\$2524.52** CDW 54884
T2130CT **\$3036.59** CDW 54885

TOSHIBA

Toshiba T2110CS

Value-priced 75MHz notebook

- ✓ IntelDX4™ 75MHz CPU ✓ 4MB RAM, 320MB hard drive ✓ 10.4" dual-scan color display ✓ Accelerated local bus video
- ✓ AccuPoint™ integrated pointing device ✓ Internal AC adapter, no bulky "brick" required ✓ Call for additional details

ONLY \$2179.39 CDW 54886



Targus Leather Notebook

Lifetime Warranty

- ✓ Luxurious full grain leather ✓ Padded computer section: 15" x 11" x 2.5" ✓ Large exterior pocket: 13" x 9" x 2"
- ✓ Detachable padded shoulder strap with steel fittings ✓ Expanding file with 3 divided sections ✓ Disk pockets, pen and business card holders



\$79

w/CPU purchase*
CDW 54728

*While supplies last.

TOSHIBA

Satellite Pro T2150CD Series

High-performance multimedia value

- ◆ IntelDX4™ 75MHz CPU ◆ 4MB RAM (T2150CDS) or 8MB RAM (T2150CDT) ◆ 10.4" dual-scan color display (T2150CDS) ◆ 10.4" active-matrix color display (T2150CDT) ◆ Integrated double-speed CD-ROM ◆ PCMCIA slot: accepts two Type II or one Type III card ◆ AccuPoint™ integrated pointing device
- ◆ NiMH battery, 2.5 hours life ◆ Three year warranty



T2150CDS, 600MB **\$3078.39** CDW 51893
T2150CDT, 800MB **\$3669.85** CDW 51894

TOSHIBA

Toshiba T2400CS

The ultimate 50MHz color notebook value

- ◆ IntelDX2™ 50MHz CPU ◆ 4MB RAM, 320MB hard drive ◆ 9.5" dual-scan color display ◆ One Type III and one Type II PCMCIA slot
- ◆ Keyboard-integrated AccuPoint™ pointing device ◆ 3 year warranty



ONLY

\$1699.00

CDW 45054

TOSHIBA

Satellite T2100 Series

Power made affordable

- ◆ IntelDX2™ 50MHz CPU ◆ 4MB RAM std. 28MB max. (T2100, T2100CS) or 8MB RAM std. 32MB max. (T2100CT)
- ◆ 250MB or 330MB hard disk drive ◆ Choice of displays: 10.4" dual-scan color (T2100CS), 8.4" active matrix color (T2100CT) or 9.5" dual-scan mono (T2100) ◆ Local bus video ◆ 1MB video RAM (T2100CS, T2100CT) ◆ PCMCIA slot: accepts two Type II or one Type III card ◆ Ports: serial, parallel, external monitor, PS/2 keyboard
- ◆ Optional port replicator for convenient desktop use ◆ Full-size 82-key keyboard with AccuPoint integrated pointing device ◆ NiMH rechargeable battery pack, 2.5+ hours life, MaxTime™ power management ◆ Built-in power supply, no external A/C adapter required ◆ Pre-loaded MS-DOS® and Windows® ◆ Weighs less than 7 lbs ◆ One year U.S. and international warranty



T2100, 250MB **\$1399.24** CDW 50879
T2100CS, 330MB **\$1979.77** CDW 50880
T2100CT, 330MB **\$2676.78** CDW 50881

TOSHIBA

Mobile Pentium T4900CT

Maximum performance color notebook

- ✓ 75MHz Intel Pentium® CPU (3.3 volt and SL-enhanced) ✓ Integrated floating point math coprocessor, 16KB CPU cache ✓ 8MB high speed RAM std., 40MB max. ✓ High-performance 772MB hard drive ✓ Large active matrix color display: 10.4" diagonal ✓ Local bus video with graphics accelerator: 64K colors at 640 x 480
- ✓ Supports simultaneous display on external monitor ✓ 16-bit WAV and MIDI sound capability: built-in microphone and speaker ✓ 2 PCMCIA slots: 6mm Type II and 10.5mm ✓ AccuPoint keyboard-integrated pointing device, QuickRead status icons ✓ Ports: serial, parallel, PS/2 mouse, PS/2 keyboard, expansion bus, external monitor, headphone/speaker, and microphone ✓ NiMH battery pack, 2+ hours life, Maxtime Power System ✓ Pre-loaded MS-DOS®, Windows for Workgroups, Windows Sound System ✓ Three year warranty



ONLY

\$4689.66

CDW 47052

If You Find a Better Price, Call CDW Before You Buy!

CDW® Sells for Less and Services You Better!

(800) 326-4CDW

PCM1222

©1995 CDW® Computer Centers, Inc.

GET DOWN TO BUSINESS WITH CDW'S LOW PRICES



WHY PAY RETAIL? CDW® Sells For Less!

FOR TOP-SELLING NOTEBOOKS!

TOSHIBA

NEW

Toshiba T3600CT

Color subnotebook computer

- ✓ 3.3 volt IntelDX2™ 50MHz CPU
- ✓ 8MB RAM std., 24MB max.
- ✓ 500MB hard drive
- ✓ 8.4" TFT active matrix color display
- ✓ Local bus video with graphics accelerator
- ✓ Type II PCMCIA slot
- ✓ Standard external 3.5" floppy drive
- ✓ Lithium Ion battery, 3-6 hours life
- ✓ Keyboard-integrated AccuPoint pointing device
- ✓ Lightweight and compact: 7.9" x 9.9" x 1.8", 4.4lbs.
- ✓ 3 year warranty



FREE!

Receive FREE installation of any memory, PCMCIA cards, multimedia products or accessories when you purchase a CPU or printer from CDW! We are your one stop shop for all your needs!

ONLY

\$3186.39 CDW 51507

NEC Versa 2000 Series

NEW

Outstanding performance and value!

- ◆ IntelDX4™ 75MHz CPU ◆ 4MB RAM std., 36MB max (2000D) ◆ 8MB RAM std., 40MB max (2000C) ◆ 10.4" dual-scan color display (2000D) ◆ 9.5" TFT active-matrix color display (2000C) ◆ Local bus video with video accelerator ◆ PC Card (PCMCIA slots) two Type II or one Type III ◆ 14.4K bps data/fax modem (2000C) ◆ VersaGlide touch pad pointing device ◆ Lithium Ion battery pack, up to 5 hours life ◆ 1 year warranty



2000D, 350MB
2000C, 350MB
2000C, 540MB

\$1919.84 CDW 55189
\$2489.73 CDW 55170
\$2678.82 CDW 55171

TOSHIBA

Portege 610CDT Ultra-portable 90MHz Pentium power!

- ✓ 90MHz Intel Pentium™ CPU
- ✓ 8MB EDO RAM, 720MB hard drive
- ✓ 9.5" active matrix color display
- ✓ PCMCIA slots: two Type II or one Type III
- ✓ Built-in 16-bit sound, Sound Blaster Pro compatible
- ✓ Integrated AccuPoint™ pointing device
- ✓ Compact and lightweight: less than 5 lbs.



ONLY

\$4338.05 CDW 54866

TEXAS INSTRUMENTS

TravelMate 5000

Intel Pentium™ power and PCI bus performance

- ✓ 3.3 volt Intel Pentium CPU, 75MHz
- ✓ 256KB L2 cache, full 64-bit memory system
- ✓ 8MB RAM std., 32MB max.
- ✓ 32-bit PCI local bus architecture, 33MHz
- ✓ Display: 10.4" active matrix color or 10.4" dual-scan color
- ✓ PCI local bus video, 2MB video RAM, 4096 colors
- ✓ External monitor support
- ✓ 16-bit sound card, internal speaker and microphone
- ✓ slot: one Type III or two Type I/II
- ✓ Two lithium ion battery packs, battery life: up to 5 hours
- ✓ Keyboard-integrated pointing device
- ✓ 3 year parts and labor warranty



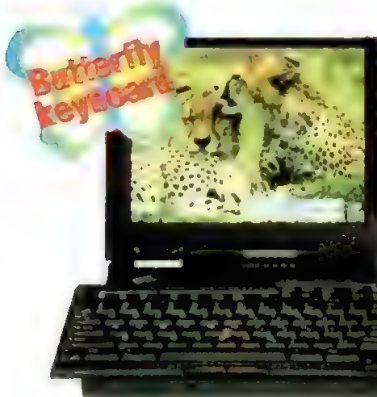
TM5000, 810MB \$4539.22 CDW 52185
TM5000, 524MB \$3868.65 CDW 52166

IBM® ThinkPad® 701C

The no-compromise subnotebook

The IBM ThinkPad 701C family offers a revolutionary new expanding "butterfly" keyboard and large active-matrix color screen, all in a high performance, super lightweight subnotebook.

- ✓ IntelDX4™ 75MHz CPU
- ✓ 8MB RAM, 24MB max.
- ✓ 360MB or 540MB removable hard drive
- ✓ 10.4" active-matrix color display (701C) ✓ 10.4" dual-scan color display (701CS)
- ✓ Local bus video with 1MB RAM
- ✓ PCMCIA: accepts 2) Type II or 1) Type III
- ✓ Built-in 14.4K bps fax/modem with voice and telephony functions
- ✓ Full size, 85-Key TrackWrite™ expandable keyboard
- ✓ Keyboard-integrated TrackPoint III® pointing device
- ✓ Rechargeable Super NiCD battery
- ✓ Optional MultiPort II port replicator
- ✓ Includes external 3.5" floppy drive
- ✓ Preloaded IBM PC DOS™ 6.3 and Windows® 3.11
- ✓ Preloaded IBM® Warp V3.0
- ✓ 3 year international warranty
- ✓ Lightweight and compact: 4.5 lbs, 9.7" x 7.9" x 1.7"



PRICE DROP



701CS 360MB

\$3549

CDW 51794

701CS 540MB

\$3849

CDW 51795

701C 360MB

\$4299

CDW 51792

701C 540MB

\$4599

CDW 51793

If You Find a Better Price, Call CDW® Before You Buy!

CDW® Sells for Less and Services You Better!

(800) 326-4CDW

PCM1322

©1995 CDW® Computer Centers, Inc.

MOST ORDERS SHIP THE SAME DAY

COMPUTER DISCOUNT WAREHOUSE



COMPUTER DISCOUNT WAREHOUSE



OverDrive[®] Processors

Power up to a new performance level

Add an Intel Pentium[®], IntelDX4[®], or IntelDX2[®] OverDrive[®] processor to your Intel486[®] CPU-based and run your applications at amazing speeds. To find out which OverDrive CPU is right for your application, call your CDW account executive today.

As low as **\$125.68** CDW 39783

WHY SETTLE FOR LESS?

CDW[®] SERVICES YOU BETTER



HP DeskJet 660C

Advanced-technology color inkjet printer

- Print speed: up to 4 ppm (monochrome); 1.5 ppm (color)
- User-selectable resolution: 600 x 600 dpi, 600 x 300 dpi or 300 x 300 dpi
- 512KB RAM standard
- HP PCL 3 emulation
- Parallel interface
- 3 year warranty
- HP-C2164A



ONLY **\$489.76** CDW 53419

CDW CARRIES OVER 20,000 PRODUCTS. IF YOU DON'T SEE IT, CALL!

COMPUTERS

TOSHIBA

T2100C DX2/50 250MB mono	1399.24
T2100C DX2/50 330MB dual chr	1979.77
T2100C DX2/50 330MB act color	2676.78
T2110C DX4/75 350MB pas color	2179.39
T2130C DX4/75 500MB act color	2524.52
T2130C DX4/75 500MB pas color	3036.58
T2150C DX4/75 500MB pas color CD	3078.39
T2150C DX4/75 500MB act color	3669.85
T2400C 320MB dual color	1899.00
T2400C 250MB act color	2529.43
T2400C 320MB act color	2739.45
T2450C 320MB act color	3108.10
T2450C 500MB act color	3198.17
T3800C 500MB act color	3186.39
T4850C 475 520MB act color	3258.67
T4900C P75 772MB act color	4699.86

AST

Ascendia 810W 486 510MB pas color	1999.88
Ascendia 910W 4500 340MB pas color	2459.73
Ascendia 910W 475 510MB pas color	2649.50
Ascendia 910W 475 510MB act color	3670.81
Ascendia 910W 475 710MB act color	3666.22
Advantage 8086 486 540MB CD	1919.82
Advantage 8075 575 1GB CD	1987.44
Advantage 8090 590 1GB CD	2067.86
Advantage 8100 510 1GB CD	2819.33
Bravo M5T 590 540MB	2839.14

IBM

ThinkPad Portables

701CS DX4/75 380MB act color	4299.00
701CS DX4/75 540MB act color	4599.00
755CX 575 540MB act color	6549.00
755CX 575 810MB act color	6999.00
755CD 540MB act color 2x CD-ROM	6349.00
755CD 810MB act color 2x CD-ROM	6799.00
360CSE DX2/50 540MB pas color	3049.00
360CE DX2/50 340MB act color	3099.00
360CE DX2/50 540MB act color	3449.00

Active

Active 535 DX2/50 540MB	1369.00
Active 535 DX2/50 540MB MT	1095.00

PC385 Series desktops

PC385 DX2/50 6MB 540MB	1649.00
PC385 DX4/100 8MB 540MB	1929.00

NEC

Versa V DX2/50 250MB dual chr	2149.87
Versa V DX2/50 250MB act chr	2296.63
Versa V DX2/50 340MB act chr	2389.81
Versa V DX2/50 540MB act chr	2678.65
Versa 2000 475 540 act chr	2678.82
Versa 2000 475 500MB act chr	2489.73
Versa 2000 475 350MB dual chr	1910.84
Versa M DX4/75 340MB true chr	2848.67
Versa M DX4/75 540MB h-ras chr	3337.46
Versa M DX4/100 540MB h-ras chr	3939.50
Versa M DX4/100 540MB true chr	3426.27
Versa M DX4/100 810MB h-ras chr	4349.06
Versa P 575 540MB act chr	4647.39
Versa P 575 540MB h-ras chr	4619.83
Versa P 575 810MB act chr	5029.86
Versa P 575 810MB 10 4" h-ras chr	5349.62
Versa P 575 810MB 9 5" h-ras chr	4998.58

TEXAS INSTRUMENTS

TN4000M SX2/50 200MB dual color	1999.00
TN4000M DX2/50 340MB dual chr	1945.78
TN4000M DX2/50 455MB act chr	2199.83
TN4000M DX4/75 344MB act color	2196.36
TN4000M DX4/75 455MB dual color	2196.36
TN4000M DX4/75 455MB act color	2938.43
TN4000M DX4/100 524MB act color	3207.17
TN5000 575 524MB dual chr	3468.65
TN5000 575 810MB active chr	4939.22

DOT MATRIX & LASER PRINTERS

OKidata

184 Turbo	219.14
ML320	299.88
ML321	427.40
ML380	212.43
ML385	954.07
ML395C	1039.74
ML520	365.77
ML521	486.27
ML580	417.17
ML591	579.12
Placemart 3410	1213.95
OL400E	384.68
OL410E	539.89
OL410E/PB	964.98
OL810E	789.33
OL830 Plus	1076.51
OL1200	1115.88
OKJET 2010	367.77

Canon

BJ100X	944.88
BJ300 mono	359.88
BJ700 color	386.88
BJ1000	369.88
BJ2000	229.88
BJ230	391.55
BJC600e color	471.99
BJC4000 720dpi + color	348.78

EPSON

AP2250	98.64
AP3250	146.45
AP3260	167.62
FX300	174.32
FX370	268.45
FX1170	405.23
AP5000+	229.71
LO1070+	375.26
LO870	454.44
LQ1170	549.65
LQ2550	964.09
DFX5000 Plus	1384.01
DFX8000	2322.45
Stylus 300	183.14
Stylus 800+	211.14
Stylus 1000	479.34
Stylus Color	529.53
ActionLaser 1100	383.82
ActionLaser 1400	495.53

LEXMARK LASER PRINTERS

WinWriter 400 laser	755.03
ValueWriter 600 laser	999.00
ValueWriter 300 (4037 SE SPPM)	444.87
ValueWriter 600 laser	815.87
4030 10 Plus 10ppm	1218.36
Optra R 12ppm	1423.63
Optra R 10ppm	1988.32
EasyJet IIc	393.78

Panasonic

1150	133.49
2023	182.27
2130	304.48
3130	347.63
3123	249.00
4400 Laser	454.90
5400 Laser	409.49
KX-SP100 printer/fax/copier	756.48

TEXAS INSTRUMENTS

microWriter PS23	639.65
microLaser 600	885.10
microLaser Pro 600 PS23	1197.02
microLaser Pro E	1395.49
microLaser Power Pro 600 P885	1629.80

HEWLETT PACKARD

OfficeJet inkjet fax/copier/printer	898.00
DeskJet 540	299.79
DeskJet 560C	489.78
DeskJet 1200C	994.48
DeskJet 1200C PS	1599.49
LaserJet 5P	399.77
LaserJet 4 plus	1449.96
LaserJet 4S	2998.95
LaserJet 455	1987.38
LaserJet Color	5929.82

OOSTAR

LabelWriter XL Win	139.88
LabelWriter Plus Win	224.89

HARD DRIVES & CONTROLLERS

Maytag

270MB Fast-ATA	151.88
345MB SCSI-2	174.88
425MB Fast-ATA	181.17
540MB Fast-ATA	195.88

MICROMILL

4221 20B SCSI-2	1164.48
3243 4 30B SCSI-2	1572.48
1936 30B SCSI-2	982.95

CONNER

425MB IDE	173.33
540MB IDE	218.08
850MB Fast ATA	286.08
1.27GB Fast-ATA	373.31

All Conner drives listed include complete installation hardware and software

Seagate

425MB Fast-ATA	172.88
545MB Fast ATA	187.12
855MB Fast ATA2	246.99
1GB Fast ATA2	328.75
1 GB SCSI-2	549.91

WESTERN DIGITAL

Conner 540MB IDE	204.55
Conner 730MB EIDE	264.25
Conner 1GB EIDE	359.79
Conner 1.2GB EIDE	358.84

CONTROLLERS

AcuLogic SIDE 3+ w-on-board BIOS	48.90
AcuLogic SIDE 4+ w-par 2ser game	35.08
AcuLogic SIDE 4+ EIDE 18550 serial	89.78
AcuLogic ISAport SCSI-2	126.49
Adaptec AVA1505 SCSI-2 CD Kit	54.95
Adaptec AHA1542C SCSI-2	263.45
Adaptec AVA2825 VLB SCSI-2/EIDE	166.81
Adaptec 2842 VLB SCSI-2	249.63
Promise 2300+ EIDE VLB	59.87

MODEMS & COMMUNICATIONS

Robotics

SPORTSTER MODEMS

V 34 28.8K internal w/fax	224.90
V 34 28.8K external w/fax	242.06
V 28.8K internal w/fax & voice	241.40
V 28.8K external w/fax & voice	255.14
14.4K internal w/fax	94.81
14.4K external w/fax	111.69
V 14.4K internal w/fax & voice	113.59
V 14.4K external w/fax & voice	133.70

COURIER MODEMS

V 34 internal w/fax	387.60
V 34 external w/fax	427.32

Hayes

ACCURA 144 internal w/fax	81.87
ACCURA 144 external w/fax	111.18
ACCURA 288 V 34 internal w/fax	193.78
ACCURA 288 V 34 external w/fax	216.88
OPTIMA 144 external w/fax	374.30
OPTIMA 144 pocket w/fax	312.59
OPTIMA 288 V 34 internal w/fax	365.14
OPTIMA 288 V 34 external w/fax	415.44

AcuLink

14.4 internal w/fax	73.85
14.4 Mini Tower w/fax	88.76
V 34 28.8 internal w/fax	195.99
V 34 28.8 Mini Tower w/fax	209.64
Practical Pro Series	CALL!

BOCA

Online Express 14.4 internal w/fax	44.25
Online Express 14.4 external w/fax	79.78
V 34 28.8 internal w/fax	164.44
V 34 28.8 external w/fax	389.80

MICROCOM

Deskpro ES 14.4	146.39
Deskpro Fast ES V 34 28.8	179.94
Deskpro Fast EP V 34 28.8	229.99

BATTERY BACKUP AND UPS

American Power Conversion

BackUPS 280	89.53
BackUPS 400	144.28
BackUPS 600	175.81
BackUPS 800	243.00
BackUPS 900	345.78
BackUPS 1250	449.29
SmartUPS 400	299.69
SmartUPS 600	383.38
SmartUPS 800	514.61
SmartUPS 1250	844.24
SurgeArrest Network	29.25
SurgeArrest Pro	49.98
Line-R 600	119.09

Tripp Lite

BC250	84.97
BC PERS 420	138.91
BC PRO 550	168.16
BC PERS 500	173.09
BC PRO 675	231.43
BC PRO 850	289.03
BC PRO 1050	327.59
BC PRO 1400	426.10

Tripp Lite Smart UPS Series

SMART 280 LAN	318.30
SMART 450 LAN	273.94
SMART 675 LAN	313.68
SMART 850 LAN	369.74
SMART 1050 LAN	455.07
SMART 1400 LAN	559.41
Isobar 4 OUTLET	38.95
Isobar 6 OUTLET	46.38

PCMCIA CARDS

3Com Etherlink IIB combo	213.80
Hayes EZ Jack 14.4 w fax	179.46
Hayes EZ Jack V 34 w/fax	299.87
IBM Token Ring 16/4	399.97
Linksys Ethernet combo	165.74
Megahertz 14.4K data/fax	179.48
Megahertz 14.4K data/fax	169.53
Megahertz 14.4K data/fax	198.89
Megahertz V 34 Kjack data/fax	299.78
New Media Bus Toaster SCSI-2 host	199.94
New Media Wave Jammer sound card	229.48
New Media Multimedia Combo	439.80
Simple Tech 14.4K data/fax modem	145.51
Simple Tech 14.4K modem + voice	143.07
Simple Tech Ethernet 10BT adapter	135.42
Simple Tech SCSI adapter	163.68
Simple Tech 130MB hard drive	359.88
Simple Tech 170MB hard drive	404.60
Adaptec APA1480 SCSI-2	209.89
Turbo Tech Audio Advantage	113.98
USR Sportster 14.4K	178.90
USR Sportster V 34	348.78
Xircom Ethernet coas	79.00
Xircom Ethernet 10BT	158.09
Xircom Ethernet combo	206.15
Xircom Ethernet-modem 10BT	398.19
Xircom Ethernet-modem combo	451.67
Xircom Token Ring 16/4	409.49

INTEL OVERDRIVE

Intel OverDrive DX2/50	125.88
Intel OverDrive DX2/66	139.79
Intel OverDrive DX4/75	175.98
Intel OverDrive DX4/100	259.77
Intel OverDrive Pentium 63MHz	339.45

MEMORY UPGRADES

simple

AST Ascendia 910W 486	CALL!
AST PowerEPC 4/33SL 4MB	CALL!
AST PowerEPC 4/33SL 16MB	CALL!
HP LaserJet 4L 1MB	CALL!
HP LaserJet 4P 4MB	CALL!



PRESENTING TWO FIRST CLASS TICKETS TO MULTIMEDIA PARADISE FROM MPC TECHNOLOGIES

COMES W/
10.4" SCREEN



10.4" SCREEN
OPTIONAL



Special!
Starts at

Limited supplies

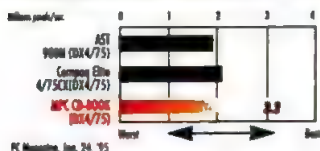
MPC TECHNOLOGIES, INC.

offers the best value in notebook solutions. High-performance feature-include upgradeable processors up to DX4-100, expandable memory, upgradeable hard drive, built-in 5.25" double-speed CD-ROM drive, 16-bit stereo sound card, microphone, speakers, and many more.

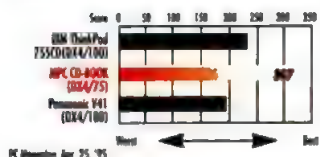
MPC's new TouchNote™ touch pad provides unprecedented comfort with the unique, ergonomically designed touch pad. Call today for down-to-earth prices on the most advanced notebooks available.

COMPARISON DONE BY...

GRAPHICS WINMARK



DISK WINMARK 95



700 SERIES SPECIFICATIONS

- DX2-50, DX2-66, **DX4-75 or 100 MHz**
- **8MB RAM**, max 32MB; EMS 4.0 support
- 3.5" 1.44MB FDD
- Slide-out HDD 340MB up to 800MB
- 9.5" or optional **10.4"** color dual scan STN LCD
- 1MB Video Local Bus
- VGA port support 1024 X 768 X 256 color
- New **PCMCIA IV** slots, support 1 type II & 1 type III
- Built-in **Touch Pad** or 19mm extra-large centertrack ball
- Built-in 16-bit stereo **Sound Blaster** compatible
- True **3.3 Volt** system
- Advanced SMI power management
- System status panel
- NiMH battery with **HOT SWAP** feature
- I/O: parallel, serial, VGA, audio in/out, docking connector
- Built-in microphone & stereo output
- MS-DOS & Windows for Work Group
- 5.7lbs, including battery pack

800 SERIES SPECIFICATIONS

- DX2-50, DX4-66, **DX4-75 or 100 MHz**
- Built-in double speed **CD ROM** supports 5.25" CDs
- Optional **MEG 1**
- 4MB expandable to 32 MB
- 9.5" Dual Scan & TFT Active LCD screen
- Accelerated 32-bit VESA Local Bus VGA with 1MB
- VGA port support 1024 X 768 X 256 color
- Built-in pointing device (Versa Point)
- PCMCIA Type III slot
- 16-bit stereo (**Sound Blaster** compatible)
- NiMH battery
- Advanced power management
- Built-in microphone & stereo speakers
- I/O: parallel, serial, VGA & audio in/out
- DOS & Windows for Work Group
- 6 lbs. (DS) with battery
- Free Cigarette lighter adapter
- External 3.5" FDD

"MPC CD-BOOKs are the closest we've come to real desktop replacements. They are the first true, self-contained portable multimedia machines"



— PC Magazine, Dec. 6, '94

"MPC's CD-BOOK is the first one to give the traveling executive an integrated multimedia notebook."



— PC Magazine, Nov. 22, '94

"Notebook computer design and multimedia features mesh nicely in the CD-BOOK 800 series from MPC Technologies, Inc."



— Computer Shopper, Feb. '95

"MPC's CD-BOOK is the lightest multimedia system we've seen."



— PC Computing, Jan. '95

DOS, Windows for Work Group & Carrying Case	
DUAL-SCAN 75MHZ, 8MB/540MB	\$2,159
DUAL-SCAN 75MHZ, 12MB/340MB	\$2,209
DUAL-SCAN 100MHZ, 12MB/340MB	\$2,269

with DOS, Windows for Work Group, PCMCIA 14.4 FAX/Modem Card, Car Adapter & Targus Loco Case	
DUAL-SCAN 75MHZ, 8MB/340MB	\$2,249
DUAL-SCAN 100MHZ, 12MB/800MB	\$2,699
TFT ACTIVE-MATRIX 100MHZ, 8MB/540MB	\$3,269

MPC's TOUCHNOTE™ EASY PACKAGE	
with DOS, Windows for Work Group, 24H-1 Ethernet Card, Car Adapter & Targus Loco Case	
DUAL-SCAN 75MHZ, 8MB/800MB	\$2,559
TFT ACTIVE-MATRIX 75MHZ, 12MB/340MB	\$3,339
DUAL-SCAN 100MHZ, 12MB/540MB	\$2,649
TFT ACTIVE-MATRIX 100MHZ, 16MB/540MB	\$3,699

NEW! 10.4" CD-BOOK™ DUAL-SCAN PORTABLE ONE (OPTIONAL)	
including 12 Pak CD, DOS, Windows for Work Group, Car Cable & Carrying Case	
DUAL-SCAN 75MHZ, 12MB/340MB	\$2,399
DUAL-SCAN 100MHZ, 8MB/540MB	\$2,400
DUAL-SCAN 100MHZ, 12MB/800MB	\$2,679

including 12 Pak CD, DOS, Windows for Work Group, Car Cable & Carrying Case	
TFT ACTIVE-MATRIX 75MHZ, 12MB/340MB	\$3,459
TFT ACTIVE-MATRIX 100MHZ, 8MB/540MB	\$3,469

DUAL-SCAN 100MHZ, 4MB/340MB	SPECIAL! \$1,895
with DOS only	
DUAL-SCAN 100MHZ, 8MB/540MB	\$2,248
DUAL-SCAN 100MHZ, 12MB/340MB	\$2,299

with DOS, Windows for Work Group, & Carrying Case
700 Series TouchNote Carves With 7.5" Screen Display

10.4" screen option on CD-BOOK™ is available, please contact MPC's sales department.

MOVIE CONFIGURATIONS ARE FOR IMMEDIATE DELIVERY.

FOR OTHER CONFIGURATIONS OR TRACKBALL POINTING DEVICE PLEASE CONSULT WITH MPC'S SALES DEPARTMENT



1-800-672-9960

SALES DEPARTMENT OPENS EVERY DAY
EXCEPT HOLIDAYS

MON.-FRI. 6:30AM-6PM PST. SAT.-SUN. 9AM-3PM PST



MPC Technologies, 2919 Main Street, Santa Ana, CA 92705

Local: (714) 724-9960. (800) 672-9960

FAX: (714) 724-9960. BBS: (714) 724-1919/724-1943

Technical Support: (800) 672-9960. 24-Hour FAX/Track: (800) 672-9960

Customer Service: (800) 672-9960

Terms: No sub-charge for MasterCard or Visa orders. Credit card purchases subject to service charge. Purchases orders accepted from approved corporations, government institutions and universities. 30-day money-back guarantee, not including shipping. All trademarks and registered trademarks are of their respective companies. All prices & configurations subject to change without notice or obligation. CD-BOOK™ and TouchNote™ are licensed trademark of MPC Technologies, Inc. MPC Technologies is not responsible for any advertisement errors. All repair or replacement of defective parts is at the discretion of MPC Technologies, Inc. There are no returns for credit after 30 days. All returns must be shipped in original packaging. Shipping, handling and opened software are non-refundable during and after 30-day money back guarantee period.

CIRCLE 177 ON READER SERVICE CARD

COMPLEAT SATISFACTION

CALL
for
Guaranteed
Lowest
Prices!

PCs
COMPLEAT
800-775-4727

digital™



DIGITAL STATION
MULTIMEDIA
COMPUTERS
NOW AVAILABLE!
CALL FOR DETAILS

HiNote

HiNote

- All models 5.5 lbs. or less - **ONLY 1.6" thick**
- Upgradable hard drive - easily add more storage
- Built-in front mounted trackball - easy to use for right- & left-handed users
- 3-year warranty - **FREE** 1-year Passport Service

Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	340MB	\$1929
486DX2/50	9.5" Active	240MB	2079
486DX4/75	9.5" Dual Scan	510MB	2069
486DX4/75	9.5" Active	340MB	3249
486DX4/75	9.5" Active	510MB	3589

HiNote Ultra
as low as

\$1879



HiNote Ultra

HiNote Ultra

- All models 4 lbs. or less - **ONLY 1.1" thick**
- Built-in sound, microphone & speaker
- Lithium Ion battery technology
- Built-in infrared
- 3-year warranty - **FREE** 1-year Passport Service

Processor	Screen	HD	Price
486SX/33	9.5" Mono	170MB	\$1879
486SX/33	9.5" Dual Scan	240MB	2599
486DX2/50	9.5" Dual Scan	340MB	2959
486DX2/50	9.5" Active	340MB	4119
486DX4/75	9.5" Dual Scan	510MB	3659
486DX4/75	9.5" Active	340MB	4579
486DX4/75	9.5" Active	520MB	4719

COMPAQ



Contura 410

Contura 410

- Upgradable hard drive - easily add more storage
- 32-bit local bus with 1MB video RAM
- Extended life NiMH battery technology
- Compaq, 3-year worldwide warranty

Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	350MB	\$1989
486DX2/50	8.4" Active	350MB	2359



LTE Elite

LTE Elite

- 10.4" Active Matrix display
- Fast 486DX4/75 processor
- Built-in AC adapter - small, sleek design & reduced weight
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
486DX4/75	9.5" Dual Scan	340MB	\$2739
486DX4/75	9.5" Dual Scan	510MB	3119
486DX4/75	10.4" Active	510MB	4159
486DX4/75	10.4" Active	810MB	4539

Angia Modem

28.8/14.4, V.34
PCMCIA, SJ288

\$349.99



Luxurious Leather

\$99.99

Lifetime
Passport
Warranty



TARGUS

Additional
styles and colors
available

Magnavox

15" Flat screen
SVGA monitor
1024x768ni (.28)

\$349.99



Smart Modular

SMART ST2814
28.8/14.4
V.34 fax/modem

\$299.99



Ether•Modem

14.4/14.4 & 10BaseT Ethernet

\$369.99



Modem	Description	Price
XJ1144	14.4/14.4 XJACK	\$179.99
CC3144	14.4/14.4 PCMCIA	179.99
XJ2144	14.4/14.4 XJACK GOLD	209.99
CC4144	14.4/14.4 PCMCIA GOLD	179.99
XJ2288	28.8/14.4 XJACK	349.99
CC3288	28.8/14.4 PCMCIA	349.99
EM1144T	14.4/14.4 EtherModem	369.99

Megahertz

ONLY at PCs COMPLEAT

✓ Lowest Price
Guarantee

✓ 30-Day Money
Back Guarantee

✓ Free Tech
Support

✓ Free Software
Installation

✓ Free
Configuration



Additional Products from AST

Processor	Screen	HD	Price
Ascentia 950N			
Pentium 75	10.4" Dual Scan	500MB	\$3439
Pentium 75	10.4" Dual Scan	800MB	3739
Pentium 75	10.4" Dual Scan	1.2GB	4229
Pentium 75	10.4" Active	800MB	4899
Pentium 75	10.4" Active	1.2GB	5399

Advantage Adventure Multimedia (4X CD-ROM)

All-in-One (4000)	486DX2/66	540MB	\$1499*
Desktop (6000)	486DX2/66	540MB	1119
Desktop (6000)	486DX2/66	540MB	1299
Desktop (6000)	Pentium 75	540MB	1589
Minutower (8000)	Pentium 75	1GB	1999
Minutower (8000)	Pentium 90	1GB	2149
Minutower (8000)	Pentium 100	1GB	2799
			3199
			3499

Monitors Priced Separately *Monitor Built Into CPU



Ascentia 910N

Ascentia 910N

- 10.4" Active & 10.8" Dual Scan
- Lithium-Ion battery technology
- Intelligent power management to maximize performance
- Integrated Smartpoint - small, accurate & easy to use

Processor	Screen	HD	Price
486DX2/50	10.3" Dual Scan	340MB	\$2559
486DX4/75	10.3" Dual Scan	510MB	2749
486DX4/75	10.3" Dual Scan	700MB	3049
486DX4/75	10.4" Active	510MB	3829
486DX4/75	10.4" Active	700MB	4129

AST, AST logo are trademarks of AST Research, Inc. All rights reserved.



ThinkPad 755CD

ThinkPad 701
as low as

\$3699



ThinkPad 701



ThinkPad 701

ThinkPad 701

- Amazing pop-up full-sized keyboard w/ingress design
- 10.4" Active & Dual Scan
- only 4.5 lbs. in sub-notebook form factor
- 14.4 fax modem, full-duplex speaker phone, answering machine & voice mail
- Built-in 16-bit sound microphone, speaker & MIDI
- Built-in infrared for no hassle printer connections
- 20 FREE software titles preinstalled

Processor	Screen	HD	Price
486DX2/50	10.4" Active	360MB	\$3699
486DX2/50	10.4" Active	540MB	4049
486DX4/75	10.4" Dual Scan	360MB	3549
486DX4/75	10.4" Dual Scan	540MB	3849
486DX4/75	10.4" Active	360MB	4299
486DX4/75	10.4" Active	540MB	4599

ThinkPad 755 Pentiums Now Available!

- Built-in CD-ROM drive (755 models only)
- Built-in 16-bit sound microphone, speaker (MIDI) or 755 CD models
- 10.4" Active & 10.8" Dual Scan
- 14.4 fax modem, full-duplex speaker phone, answering machine & voice mail
- Built-in infrared for no hassle printer connections
- 800 x 600 resolution on notebook display (Pentium models only)
- Lithium-Ion battery technology (Pentium models only)

Processor	Screen	HD	Price
486DX4/100	10.4" Dual Scan	340MB	\$4099
486DX4/100	10.4" Dual Scan	540MB	4449
486DX4/100	10.4" Dual Scan	810MB	4899
486DX4/100	10.4" Active	340MB	4999
486DX4/100	10.4" Active	540MB	5349
486DX4/100	10.4" Active	810MB	5799
486DX4/100	10.4" Active	540MB	6349*
486DX4/100	10.4" Active	810MB	6799*
Pentium 75	10.4" Active	540MB	6549
Pentium 75	10.4" Active	810MB	6999

*Features Built-In CD-ROM drive

ThinkPad 755CV
as low as

\$6799



ThinkPad 755CV - NEW! Ultimate Presentation Notebook!

- Built-in overhead projection display!
- FREE MindPath remote wireless infrared mouse
- Built-in 16-bit sound microphone & speaker
- 14.4 fax modem, full-duplex speaker phone, answering machine & voice mail
- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
486DX4/100	10.4" Active	540MB	\$6799

PACKARD BELL



Force Minutower

4X Speed Force Multimedia Computers

- Quad Speed CD-ROM drive
- 16-bit SoundBlaster compatible sound card
- PCI local bus high-speed graphics
- PCI local bus hard drive
- 14.4 fax modem, speaker phone, answering machine
- LOADS of FREE software

Chassis	Processor	HD	Price
Desktop	Pentium 75	1.28GB	\$1929
Desktop	Pentium 100	1.28GB	2419
Minutower	Pentium 75	1.28GB	2299
Minutower	Pentium 100	1.28GB	2759

Monitors Priced Separately



Force Desktop

2X Speed Force Multimedia Computers

- TWO Dual Speed CD-ROM Drives (Desktops)
- One Dual Speed CD-ROM Drive (All-in-One)
- 16-bit SoundBlaster compatible sound card
- 14.4 fax modem, speaker phone & answering machine
- LOADS of FREE software

Chassis	Processor	HD	Price
All-in-One	486DX2/66	420MB	\$1499*
Desktop	486DX2/66	420MB	1399
Desktop	Pentium 75	1.08GB	1979

Monitors Priced Separately *Monitor Built Into CPU PCW 8/05

BRANDS SUPPORT.

CALL
for
Guaranteed
Lowest
Prices!

PCs
COMPLEAT

800-775-4727

TOSHIBA

T2150

- Built-in CD-ROM Drive
- Built-in 16-bit sound, microphone, speaker & MIDI
- 10.4" Active & Dual Scan
- Built-in AC adapter - small, sleek design & reduced weight
- Integrated Accupoint - small, accurate & easy to use

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	500MB	\$2999
486DX4/75	10.4" Active	500MB	3699



**90MHz
Pentium**



Portégé 610CT

Portégé 610CT

Processor	Screen	HD	Price
Pentium 90MHz	9.5" True Color	720MB	\$4359

**75MHz
Pentium**

**T4900CT
\$4799**

T4900CT

- 75MHz Pentium - for blazing performance
- 10.4" Active Matrix display
- Built-in 16-bit sound, microphone, speaker & MIDI

Processor	Screen	HD	Price
Pentium 75	10.4" Active	772MB	\$4799

T4900



NEW!



T2130

Additional Toshiba Notebooks

Processor	Screen	HD	Price
T3600CT			
486DX2/50	8.4" Active	500MB	\$3239
T4850CT			
486DX4/75	10.4" Active	772MB	3349
Satellite T2100			
486DX2/50	9.5" Mono	250MB	\$1399
486DX2/50	10.4" Dual Scan	330MB	1999
486DX2/50	8.4" Active	330MB	2699

Satellite T2110/T2130

- 10.4" Dual Scan & Active
- Built-in AC adapter - small, sleek design & reduced weight
- Integrated Accupoint - small, accurate & easy to use

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	330MB	\$2199
486DX4/75	10.4" Dual Scan	500MB	2549
486DX4/75	10.4" Active	500MB	3059

T2100



More Brand Names, peripherals and software
available. If you don't see it, CALL!

International 508-624-6400
Internet: sales@pcscmpleat.com
Open 24 Hours weekdays. 9am-8pm weekends and holidays.

800-775-4727

CIRCLE 092 ON READER SERVICE CARD

PCs COMPLEAT

800-775-4727

CALL
for
Guaranteed
Lowest
Prices!

BUY SMART, BUY COMPLEAT.

hp HEWLETT
PACKARD



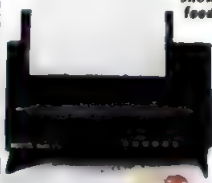
HP OmniBook 600 Notebook PC

HP OmniBook 600

- Weighs as little as 3.8 lbs
- Upgradable PCMCIA hard drive - easily add more storage
- Built-in infrared for no hassle printer connections
- Instant "ON" ready-to-work state - lasts for months on a charge

Processor	Screen	HD	Price
486DX2/50	8.5" Dual Scan	260MB	\$2549
486DX4/75	8.5" Dual Scan	260MB	3049

HP DeskJet 320 Printer
\$299.99
Shown with optional
feeder and color kit



FREE
HP ColorKit
\$40 value
Offer good
through
August 31st 1995

HP Scanners

HP ScanJet 3P (grayscale)	\$319.99
HP ScanJet 3C (color)	949.99

HP (Colorado) Tape Drives

Trakker 350MB (portable)	\$269.99
Trakker 700MB (portable)	339.99
Jumbo 350MB (internal)	139.99
Jumbo 700MB (internal)	199.99
Jumbo 1400, 1.36GB (internal)	369.99
T1000, 800MB (internal)	189.99



HP OmniBook 4000 Notebook PC

HP OmniBook 4000

- 10.4" Active & 10.3" Dual Scan
- Built-in 16-bit sound, microphone & speaker
- Replace floppy w/ 2nd battery for 5-7 hrs battery life
- Up to 810MB drives available for high capacity storage

Processor	Screen	HD	Price
486DX4/75	10.4" Active	340MB	\$2959
486DX4/75	10.4" Active	520MB	3149
486DX4/75	10.4" Active	810MB	3459
486DX4/100	10.3" Dual Scan	340MB	2999
486DX4/100	10.3" Dual Scan	520MB	3259
486DX4/100	10.3" Dual Scan	810MB	3569
486DX4/100	10.4" Active	340MB	3429
486DX4/100	10.4" Active	520MB	3619
486DX4/100	10.4" Active	810MB	3919
486DX4/100	10.4" Active	810MB	4489*

HP LaserJet Printers

HP LaserJet 5P printer (IBM, 6ppm, 600dpi)	\$879.99
HP LaserJet 5MP printer (IBM&MAC, 6ppm, 600dpi)	1039.99
HP LaserJet 4L printer (IBM, 4ppm, 300dpi)	499.99

HP InkJet Printers

HP DeskJet 320 printer (portable)	\$299.99
HP DeskJet 320 printer w/feeder	359.99
HP DeskWriter 320 printer (portable)	299.99
HP DeskWriter 320 printer w/feeder	359.99
HP DeskJet 540 printer	289.99
HP DeskWriter 540 printer	289.99
HP DeskJet 660C printer	479.99
HP DeskWriter 660C printer	479.99
HP DeskJet 1200C printer	979.99
HP DeskJet 1200C/PS printer	1589.99

Home Office Products

HP OfficeJet	\$689.99
HP FAX-700	549.99

HP LaserJet 5P 600dpi
\$879.99



NEC



Versa M

Versa M

- High Res. displays available - 800x600 res on notebook
- True color displays available - 16.7 million colors on notebook
- Removable/Reversible display
- Replace floppy w/ 2nd battery for 6-10 hrs. battery life
- Replace floppy w/ Versa Bay - Add extra PCMCIA
- Built-in 16-bit sound, microphone & speaker
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
486DX4/75	9.5" Dual Scan	250MB	\$2369
486DX4/75	9.5" Dual Scan	340MB	2459
486DX4/75	9.5" Active	340MB	2739
486DX4/75	9.5" Active	540MB	3029
486DX4/75	9.5" High Res.	540MB	3199
486DX4/100	9.5" Active	340MB	3399
486DX4/100	9.5" Active	810MB	4069
486DX4/100	9.5" High Res.	540MB	3879
486DX4/100	9.5" High Res.	810MB	4249

Ready Multimedia

- Quad Speed CD-ROM drive
- 16-bit SoundBlaster compatible sound card
- PCI local bus - high-speed graphics
- 14.4 fax/modem, speaker phone, answering machine
- LOADS of FREE software

Chassis	Processor	HD	Price
Minitower	486DX4/100	540MB	\$1699
Minitower	Pentium 75	850MB	1999
Minitower	Pentium 90	850MB	2199
Minitower	Pentium 90	1.2GB	2599
Minitower	Pentium 100	1.2GB	2799

Monitors priced separately.



Versa P

Versa P

- 75MHz Pentium - for blazing performance
- High Res. displays available - 800x600 res on notebook (10.4" on selected models)
- Removable/Reversible display
- Replace floppy w/ 2nd battery for 6-10 hrs battery life
- Replace floppy w/ Versa Bay - Add extra PCMCIA
- Built-in 16-bit sound, microphone & speaker
- Upgradable hard drive - easily add more storage

Processor	Screen	HD	Price
Pentium 75	9.5" Active	340MB	\$4069
Pentium 75	9.5" Active	540MB	4349
Pentium 75	9.5" Active	810MB	4729
Pentium 75	9.5" High Res.	540MB	4539
Pentium 75	9.5" High Res.	810MB	4899
Pentium 75	10.4" Active	540MB	4629
Pentium 75	10.4" Active	810MB	4999
Pentium 75	10.4" High Res.	810MB	5199

**Call about
the NEW
Versa
2000**

Versa V

- Replace floppy w/ 2nd battery for 6-10 hrs battery life
- Upgradable hard drive - easily add more storage
- 32-bit local bus with 1MB video RAM
- 64K colors on notebook display (Active only)

Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	250MB	\$2129
486DX2/50	9.5" Dual Scan	340MB	2179
486DX2/50	9.5" Active	250MB	2269
486DX2/50	9.5" Active	340MB	2369
486DX2/50	9.5" Active	540MB	2649
486DX4/75	9.5" Active	340MB	2549
486DX4/75	9.5" Active	540MB	2739
486DX2/50	10.1" Active	340MB	2549
486DX4/75	10.1" Active	540MB	2929

PCM 8/95

800-775-4727

More Brand Names, peripherals and software
available. If you don't see it, CALL!

International 508-624-6400
Internet: sales@pcscompleat.com
Open 24 Hours weekdays, 8am-8pm weekends and holidays.

TEXAS ROUND UP

CALL
for
Guaranteed
Lowest
Prices!

PCs
COMPLEAT

800-617-4727

**TEXAS
INSTRUMENTS**

TravelMate 5000

- 75MHz Pentium with PCI Bus to optimize Pentium processor performance
- 10.4" Active Matrix display with 2MB Video RAM
- 10.5" Dual Scan display with 2MB Video RAM
- 65K colors on notebook display
- 16-bit Sound Card, Speaker, Microphone & MIDI
- Upgradable hard drive - easily add more storage
- Built-In Dual Lithium Ion Batteries
- Built-in infrared for no hassle printer connections

Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	500MB	\$3899
Pentium 75	10.4" Active	772MB	4599

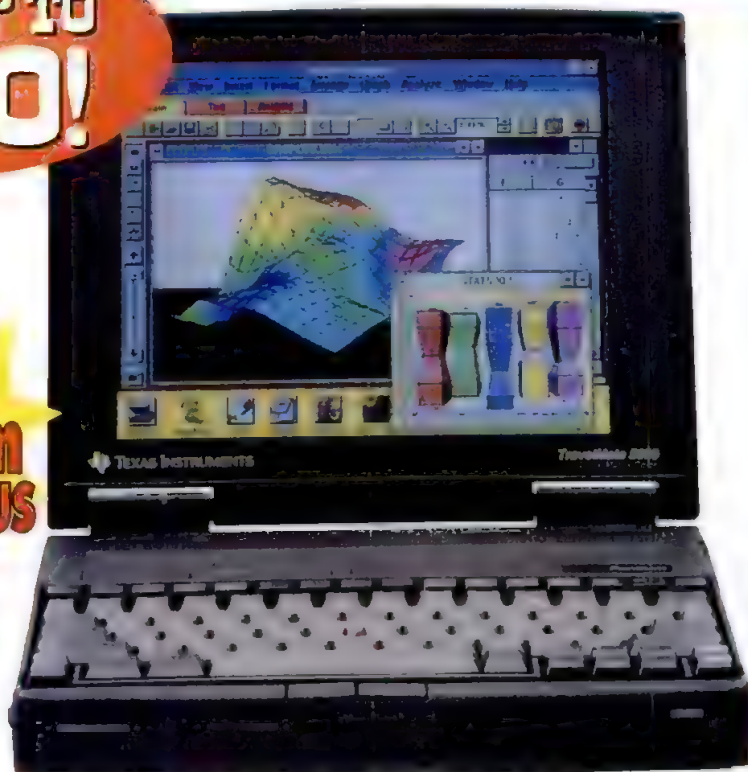
TravelMate 4000M

- Brilliant color display
- 16-bit sound card
- Integrated pointing device
- 2 Type II or 1 Type III PCMCIA slot

Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	340MB	\$1949
486DX2/50	8.4" Active	455MB	2199
486DX4/75	9.5" Dual Scan	455MB	2199
486DX4/75	8.4" Active	340MB	2199
486DX4/75	8.4" Active	455MB	2399
486DX4/100	9.5" Active	525MB	3229

SAVE UP TO
\$200!

**75MHz
Pentium
with PCI BUS**



TravelMate 5000

Texas Round Up

Round up Texas-Sized savings on Texas Instruments notebooks and selected popular peripherals. Purchase a Texas Instruments notebook from PCs Compleat at our guaranteed lowest price and lasso up to \$200 in savings on memory, modems, carrying cases, & portable CD-ROM or tape drives.

Rules of the Round up:

1. You've got your lasso primed and ready when you buy a Texas Instruments notebook.
2. Add a peripheral to your system and save \$50 on each! Round up all four peripherals included in this special offer, and save \$200!
3. PCs Compleat will install these products FREE of charge so that your notebook will be up and running right out of the box.

Call today
to lasso
Texas-Sized
savings.

Only at PCs
Compleat.



PERIPHERAL

	Original Price	AFTER \$50 Rebate
Targus Leather Notebook Case (Burgundy and Brown)	\$ 99.99	\$ 49.99
VisionTek Memory 8MB for TM5000	\$ 529.99	\$ 479.99
MHz 28.8 XJACK or MHz Ethernet+Modem	\$ 349.99 369.99	\$ 299.99 319.99
MicroSolutions 4X portable CD-ROM	\$ 379.99	\$ 329.99
or MicroSolutions portable tape drive	\$ 429.99	\$ 379.99

Program Guidelines:

Limit of one product per peripheral manufacturer with each notebook purchased. Cannot be combined with any other offer. Only while supplies last. Offer valid June 1, 1995 - August 31, 1995

PCs
COMPLEAT

800-617-4727



For Value, It's Arlington!

Thousands
of printers
in stock!

EPSON®

LX300.....	\$169
FX870/1170.....	\$279/\$379
LQ300/LQ570+.....	\$179/\$239
LQ870/LQ1070+.....	\$419/\$369
LQ1170/2550.....	\$619/\$949
DFX5000+/8000.....	\$1379/\$2299
Stylus 800+/1000.....	\$205/\$449
Action Laser 1100.....	\$369

ACTION LASER 1400 \$499
• true 600 x 600 dpi

ACTION LASER 1500
• 6 PPM • 27 fonts **\$449⁰⁰**
• with 2MB...\$499⁰⁰

• factory serviced **\$399⁰⁰**
• 2-year warranty

ActionNote 660C-DX2/66
dual scan color, 340MB...\$1849

EPSON® Stylus COLOR

The most advanced color ink jet
printer not only in its price class,
but in the industry!

\$489⁰⁰



720 DPI
color

720 dpi print resolution produces the
finest color images which are difficult to
distinguish from a photographic image.

Canon

BJ-30/100.....	\$259/\$199
BJC-70/800.....	\$345/\$799
BJC-600 or 600E.....	\$389/\$455
BJ-200ex.....	\$225
BJ-230-Wide Carriage.....	\$379
LBP-430W/1260.....	\$435/\$1249

CANON NOTEJETS

Built-in
Printer!

Notejet 486 200MB-color...	\$1849
Notejet 340MB - Color.....	\$1979
Notejet DX4/75-500MB.....	\$3399
Notejet DX4/100-810MB.....	\$3649

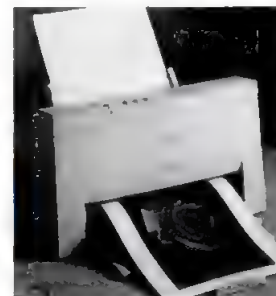
Innova Book 150C DX266-340MB.....\$1899

Innova Book 200LS DX4/100, 8MB, 520MB...\$2899

Desktop Pentium: 8MB, 540MB, CD-ROM...\$1749

BJC-4000 \$339⁰⁰

Great color all around at 5ppm.
The BJC-4000 produces 720 x
360dpi in mono and 360 x 360dpi
in color.



MODEMS



Hayes

Accura 14.4/Fax-Int/Ext	\$89/\$109
Accura 28.8 Int/Ext.....	\$169/\$209
Optima 96/14.4.....	\$319/\$349
Optima Pocket 14.4.....	\$279
Optima 28.8 Int/Ext.....	\$339/\$389
PCMCIA 14.4/28.8.....	\$149/\$309



14.4 Int/Ext.....	\$79/\$89
28.8 Int/Ext V.34.....	\$169/\$199
PCMCIA 14.4.....	\$169
Pocket 14.4/28.8.....	\$249/\$359

Robotics

Sport 14.4 Fax Int/Ext....	\$95/\$109
Sport 28.8 V.34 Int/Ext....	\$209/\$229
Courier V.34 Int/Ext.....	\$379/\$419
Sportster PCMCIA 14.4.....	\$179
Sportster PCMCIA V.34.....	\$339

MaxTech

14.4 w/FAX Int/Ext.....	\$69/\$95
28.8 Int/Ext V.34.....	\$159/\$169
PCMCIA 14.4.....	\$139

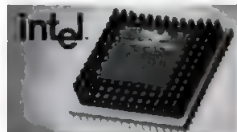
**Arlington
Computer
Products, Inc.**

hp HEWLETT PACKARD

Laserjet IV/IV+.....	\$1199/\$1399
Laserjet VP / VMP.....	\$859/\$1039
Laserjet IVL w/toner.....	\$529
Laserjet IV V/MV.....	\$1989/\$2869
Laserjet IVM+.....	\$1949
Laserjet IV SI or MX.....	\$2979/\$4229
HP IIID.....	\$1599
Paintjet XL300.....	\$2199
OfficeJet.....	\$689
Jet Direct 2550/2552.....	\$319/\$349
1MB/2MB upgrade.....	\$69/\$99
4MB/8MB upgrade.....	\$159/\$319
DeskJet 540/660C.....	\$285/\$479
DeskJet 1200C.....	\$999
DeskJet 1200C/PS.....	\$1589
3P/IIIC Scanner.....	\$329/\$919

CHIPS

1MB/4MB Simms.....	\$45/\$139
8MB/16MB Simms.....	\$319/\$559
Cyrix SRx2-20/40 & 25/50.....	\$179
Cyrix DRx2-16/32 & 20/40.....	\$179
Cyrix DRx2-25/50 & 33/66.....	\$189
HP 4MB upgrade.....	\$159
OKI Laser 2 MB.....	\$125



OVER
DRIVE

DX2-50 Double 20-25 MHZ....	\$115
DX2-66 Double 33 MHZ.....	\$129
DX4-75 MHZ/100 MHZ.....	\$159/\$229
Pentium-63MHZ.....	\$349

NETWORKING

NetWare 3.12 5-user.....	\$569
NetWare 3.12 10-user.....	\$1259
NetWare 3.12 25-user.....	\$1749
NetWare 3.12 50-user.....	\$2249
NetWare 3.12 100-user.....	\$3199
NetWare 3.12 250-user.....	\$4699
Net 4.1 5/10-user.....	\$619/\$1399
Net 4.1 25/50-user.....	\$1979/\$2499
Netware 4.1 100-user.....	\$3749
Lantastic Starter 6.0.....	\$219
Lantas 6.0 5/10-user.....	\$319/\$569
NE2000/5-pack.....	\$69/\$289
SMC TP 12 node Conc.....	\$509
SMC+16 6-pack.....	\$525
SMC Ethercard + Elite.....	\$105
3 Com EtherLink III.....	\$99
3 Com EtherLink III 5-pack.....	\$399
3 Com EtherLink III 20-pack.....	\$1439
Intel Ether 16/5-pack.....	\$89/\$429
Intel Ether 16 20-pack.....	\$1579
Intel Pro TP 5/20-pack.....	\$369/\$1299
Intel Flash 5/20-pack.....	\$399/\$1419
Intel Pro Cmbio/5-pack.....	\$99/\$409
Intel 10/100 mbps PCI.....	\$179
Intel Netport EL / XL.....	\$349/\$399
Intel Token Express Pro.....	\$229
Xircorn PCMCIA Ethernet.....	\$175

SCANNERS/DIGITIZERS

Epson Scanning 800C.....	\$729
Epson Scanning 1000.....	\$709
Epson Scanning 1200 Prof.....	\$1199
Logitech Color ScanMan.....	\$249
ScanMan w/OmniPage.....	\$139
Microtek Scan IIS/IIHR.....	\$519/\$789
Microtek Scan IIG/II.....	\$319/\$459
Avec 2400 PC Designer.....	\$489
Relisys 2412/4816.....	\$599/\$899
Relisys 4830/9624.....	\$1289/\$1599
Summasketch 12 x 12.....	\$269
Summasketch 12 x 18.....	\$499
UMAX Vista S6/LE.....	\$569/\$609
UMAX Vista S8 or LE.....	\$699/\$749
UMAX T630/630 LE.....	\$469/\$529
UMAX 1260/PRO.....	\$799/\$899
UMAX Power Look.....	\$2459
UMAX PageOffice.....	\$389

SOFTWARE

Aldus PageMaker 5.0.....	\$489
Clipper 5.2.....	\$509
Corel Draw 5.0-CD.....	\$409
Corel Draw 5.0 upgrade.....	\$169
D Base IV.....	\$379
Harvard Graphics 3.0-WIN.....	\$259
Lotus 123 2.4/3.4.....	\$279/\$325
Lotus 5.0.....	\$279
Lotus Smart Suite.....	\$379
Lotus Notes Client.....	\$409
Microsoft Office.....	\$409
Microsoft Office Pro.....	\$499
Microsoft Word.....	\$269
Microsoft Windows 95.....	call
Microsoft DOS 6.2 upgrade.....	\$59
Word Perfect 6.0A DOS.....	\$249
Word Perfect Windows.....	\$239
Word Perfect 6.0 upgrade.....	\$85

OKIDATA



400e.....	\$339*	ML380.....	\$205
410e PS.....	\$729	ML520.....	\$369
410e.....	\$499	ML521.....	\$499
OL810E.....	\$759	ML590.....	\$419
OL830.....	\$1079	ML591.....	\$569
ML320.....	\$309	ML395.....	\$959
ML321.....	\$429	ML3410.....	\$1199
Docit 3000/4000.....	\$1019/\$1349		

Panasonic Office Automation

2023.....	\$159*	3696.....	\$429
2135.....	\$189*	4400.....	\$349
2624.....	\$389	4430.....	\$639
3624.....	\$349	4440.....	\$979
3626.....	\$399	5400.....	\$479
3124.....	\$299	SP100.....	\$739
		4410/4430 2 MG.....	\$129

*after rebate

FOR ORDERS & QUOTES

800-548-5105

Toshiba Authorized Dealer!

Toshiba has three exciting, new Satellite notebook computers: the T2110CS, and the T2130 series. Both series utilize Toshiba's "Turbo75" technology, which can outperform 100MHz competitors while offering better battery life.

- T2110 CS 350MB**\$2139
Enhanced local bus video!
•DX4/75 •10.4" dual scan
- T2130 CS 520MB**.....\$2469
Graphics accelerator!
•DX4/75 •8MB RAM
- T2130 CT 520MB**.....\$2979
Graphics accelerator!
•DX4/75 •10.4" active color
•8MB RAM
•built-in power supply

Satellite T2400 Series: The ultimate value in advanced performance and expandability

- T2400CS - 9.5" dual**.....\$2029
T2400CT - 8.4" active.....\$2499
•486DX2 50MHz-SL
•Optional internal sound card
•250MB or 320MB hard drive
- T2450CT**\$3059
•Blazing fast 486DX4/75MHz
•Spectacular 9.5" active matrix color display
•2 PCMCIA slots
•AccuPoint pointing device
•Optional sound card

- T4900CT-Pentium 75**\$4669
A milestone for notebook computing! Toshiba combines the Pentium processor, a new advanced video subsystem, and Indeo Video technology for true, full-motion video. The T4900CT raises the level of your software video playback performance to new heights!
•10.4" active color
•810MB drive

TOSHIBA

Toshiba has packed plenty of power into the Satellite T2100 Series. All models come with the fast 50MHz Intel 486 DX2 processor and a math coprocessor.
•Two stacked PC card slots (PCMCIA)
•No bulky external AC adapter to carry, just a slim power cord.



- T2100: 9.5" monochrome; 4MB RAM; 250MB**.....\$1379
T2100CS: 10.4" color dual scan; 4MB RAM; 330MB.....\$1939
T2100CT: 8.4" color active matrix; 8MB RAM; 330MB.....\$2639

- T2150 CDS - DX4/75**\$2999
•500MB drive
•DS CD-ROM

CD-ROM

- T2150 CDT - DX4/75**\$3599
•500MB drive
•DS CD-ROM
- T1960CS**\$1999
T1960CT\$2099
T3600CT-500MB\$3199
T4800CT DX4/75-500MB.....\$3059
T4850CT-DX4/75 520MB.....\$3239
T4850CT-DX4/75 810MB.....\$3399
T6600C or CD.....\$4679/\$5189



MONITORS



FLAT
screens

- LX1450LG**\$239
DX15F/MX15F\$339/\$429
DX17F\$619
PC World: "A great deal, plain and simple."
MXP17F / MX21F\$799/\$1619
•.26mm •1600 x 1280 ni

NEC

- 2V/3V/XV14**.....\$329/\$399/\$299
XV15/XV17\$425/\$729
XE15/17 MultiSync\$519/\$959
XP15/17 MultiSync.....\$569/\$1019
XE21/XP21\$1749/\$2149

VIEWSONIC

- 15GS/15GA**.....\$419/\$499
17GS/17GA.....\$749/\$839
20G/20/21.....\$1299/\$1419/\$1699

PRINCETON

- Ultra 14/14ni**.....\$189/\$229
Ultra 15 1280x1024 15".....\$319
Ultra 17 1280x1024 17".....\$579

NOKIA

- 449E**.....\$439 **447L**.....\$679
447X.....\$979 **445X**.....\$2449

NANAO

- F2 17/17EX**.....\$869/\$999
F760IW/T2-17TS.....\$1949/\$1049
T2-17/20 ESP\$1289/\$1999

VIDEO BOARDS

- ATI Graph Prof 2MB**.....\$249
ATI Turbo 2MB/4MB.....\$299/\$499
Diamond Stealth 2MB.....\$289
Diamond Stealth 64 4MB.....\$429
Diamond 64 Video 2MB.....\$319
Diamond 64 Video 4MB.....\$469

DRIVES & TAPES

- Back Pack 340 / CD**.....\$419/\$299
Seagate 452MB 3491A.....\$169
Seagate 535MB 3660.....\$189
Seagate 1.0GB IDE.....\$319
West Digit 540/1GB.....\$199/\$339
1.44 / Dual Floppy\$39/\$89

COLORADO RECORD SYSTEMS INC.

- Trakker 250/350**\$259/\$269
Jumbo 350/1400.....\$139/\$339
Jumbo 700/Trakker 700.....\$199/\$319
T-1000 - 800MG.....\$199
PowerTape 1.1GB internal.....\$599
Power 2.0GB int/ext.....\$929/\$1069
250 Meg tapes formatted.....\$17



APC
AMERICAN POWER CONVERSION

- 280/400/450**\$99/\$149/\$179
600/900/1250\$239/\$339/\$439
Smart 400/450.....\$279/\$309
Smart 600/700.....\$329/\$379
Smart 900/1250.....\$469/\$589
Smart 2000.....\$1049

CD ROM

- Diamond Multi 4000 4X**.....\$279
Diamond Multi 5000 4X.....\$369
Diamond Multi 6000-home.....\$319
Toshiba Quad 3601.....\$309
Sound Blaster 16 SCSI-2.....\$165
Sound Blaster Discovery 4X.....\$379
Plextor Quad Int/Ext.....\$319/\$379
Plextor 6 Plex.....\$519

NEC

- MultiSpin 2V Deluxe**.....\$275
NEC DS 2VI & Encarta.....\$165
NEC 3Xp+/4X Pro.....\$339/\$649
NEC 4Xi.....\$365
NEC 4Xi, SCSI, Encarta.....\$439
NEC 4Xe Quad or Kit.....\$449/\$529
NEC 6Xi/6Xe.....\$449/\$539

ARLINGTON COMPUTER PRODUCTS...GREAT SERVICE SINCE 1984!

- PC MAGAZINE "...Arlington offers worry-free mail order purchasing!"
- PC COMPUTING - 1994 "A 10-year track record of consistent service!"
- PC COMPUTING "...Courteous service and terrific technical support!"
- PC World (3/95) "...Consistently the lowest prices!"

ILLINOIS - CORPORATE SALES
708-541-6694

SHIPPING
708-541-6595

CUSTOMER SERVICE AND IN ILLINOIS
708-541-6333

TECHNICAL ASSISTANCE
708-541-6583

HOURS (CENTRAL TIME)
7:30am - 8:30pm / Monday thru Friday
9:00am - 5:00pm / Saturday

FAX
708-541-6881

851 Commerce Court, Buffalo Grove, IL 60089



No surcharge for charge cards!
Prices and availability subject to
change without notice. Qualified
purchase orders accepted.

FOR ORDERS & QUOTES
800-548-5105

CALL TOLL FREE FOR SERVICE INFO

Triton Pentium

ThunderBrick

**Talk to Me
Baby...**

ThunderBrick 133

\$3,395 Lease for \$124

ThunderBrick 120

\$3,195 Lease for \$117

ThunderBrick 100

\$2,995 Lease for \$107

- 100, 120, or 133 MHz Pentium
- Intel Triton Endeavor motherboard
- 1.3 GB 10ms Hard Disk
- 16MB PM RAM (128max)
- 256k Async Cache (PB Opt.)
- ATI PCI Mach64 2MB DRAM
- 15" .28mm Color SVGA Monitor
- 4x CD-ROM, 3.5" floppy
- SoundBlaster Stereo Audio
- WFW3.11 or Win95

ThunderBrick 75

\$2,295 Lease for \$91

- 75MHz Pentium (90MHz add \$100)
 - Intel Triton Zappa motherboard
 - 850M 11ms Hard Disk
 - 16MB FPM RAM, (128max)
 - ATI PCI Mach64 1MB DRAM
 - 15" .28mm Color SVGA Monitor
 - 4x CD-ROM, 3.5" floppy
 - 15" .28mm Color Monitor
 - WFW3.11 or Win95
- Pentium ThunderBricks start at \$1,995

PowerBrick® P90

\$3,795 Lease for \$155

- 90MHz Pentium
 - 10.4" 65,000 DSTN LCD
 - 525MB removable Hard Disk
 - 16MB RAM (40 max)
 - 14-14 internal Fax/Modem
 - Two Type II slots, Stereo Audio
 - WFW3.11 or Win95
- Other NoteBricks start at \$1,795.

Hands Free and 133MHz

Triton Power

No doubt about it Intel's new Triton PCI motherboards are the fastest available. Our 75MHz Triton systems are as fast as ordinary 90MHz PCs and our 133MHz

The Ergo Difference

- 4 Year GE Warranty
- 24Hr Tech Support
- RescueMe™ Loaner
- 15 Day Money Back
- 60 Day Upgrade
- Next Day Delivery

Tritons have a Winstone95 rating of over 200. With features like EDO memory, pipeline burst cache, 100bps PCI bus, and NSP capability

built-in. We use the same Intel Triton motherboard as Dell and Gateway. Get big league performance with friendly, responsive service. You won't find a faster PC, better support or warranty anywhere else.

Major Gigabytes

Dual channel IDE supports up to four super fast 1.3 GB mode 3 & 4 hard disks. A quad speed CD-ROM and 3.5" floppy are standard, plus 2 serial & 1 EPP parallel. Software includes DOS, Windows for Workgroups 3.11 or Windows95, askSam, OAG, plus Verbex or DragonDictate voice recognition allowing total hands free use of your ThunderBrick.

Blazing Graphics

ThunderBricks feature ATI Mach64 PCI graphics boards. ATI provides the fastest 64-bit acceleration, with up to 16 Million colors at 1280x1024 resolution. Both DRAM and VRAM models are available. Combined with high performance Ergo or Nokia monitors, you'll enjoy great graphics.

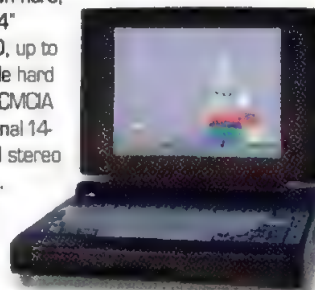
Equipped Your Way

ThunderBricks can be equipped with a wide variety of options to exactly match your needs. Our attractive packages for Networked Business, Multimedia, SoHo, CAD or DTP include the best accessories for each discipline plus they're pre-installed, ready-to-go and covered by the GE 4 year warranty.

Take Your Power Too

Ergo also offers a complete line of high performance notebooks with fast Pentium or 486DX4 power. Some feature internal CD-ROM, giant 11.3" color LCD, MPEG video playback and more. The PowerBrick Pentium 90, shown here, offers a large 10.4" 65,000 color LCD, up to a 1.3GB removable hard disk, two Type II PCMCIA slots plus an internal 14-14 fax/modem, and stereo audio all in 6.7 lbs. Its a true desktop equivalent you can take anywhere.

See our other ad in this issue or call our automatic fax for full information on this and other Ergo portable or desktop systems.



To Order or for Information
Call Mon-Fri 9-7, Sat 10-5 EST

1-800-880-1925

State-of-The-Art Computer Products...Since 1986

For Complete Information & Latest Prices
Call our 24Hr. Automatic FAX

Product	Code	Product	Code
ThunderBrick Desktops	1780	50-100MHz PowerBrick	1480
100MHz Big ScreenNoteBrick	1280	CD Brick	2180
50-75MHz SubBrick®	1180	All Products Summary	1680

1-800-723-0778

Ergo Computing, Inc. One Intercontinental Way, Peabody, MA 01960 Tel (508) 535-7510 Fax: (508) 535-7512

CIRCLE 354 ON READER SERVICE CARD

ARE YOU READY FOR WINDOWS 95?

TECHWORKS HAS IT ALL — OVER 4 MILLION MEMORY UPGRADES INSTALLED



"Memory has a
bigger impact on Windows 95's

performance than any other single component.

If you don't have at least

16MB of RAM,



prepare to Upgrade."

—Windows Sources magazine

JUST CALL TECHWORKS — THE MEMORY EXPERTS

Call today with your computer model and amount of installed RAM and we'll do the rest. It's that simple!

- We'll identify your system's requirements and advise you of your upgrade choices.
- We'll ship you high-quality upgrades, overnight on most products.
- We'll help you get up-and-running with a Memory Installation Guide and Toll-Free Technical Support.
- We'll back our memory products for a lifetime with our Outrageous Customer Service.

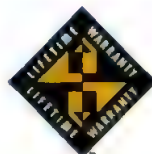
So, whether you are a reseller or an end user, give us a call and let TechWorks give you the Power to Perform.™



CALL 1.800.434.4036

4030 WEST BRADEN LANE • AUSTIN, TEXAS 78759-5319
AUSTIN OFFICE: 512-794-8533 FAX: 512-794-8520
UNITED KINGDOM OFFICE: +44 (0) 181 • 498 • 9500

CALL TODAY AND LET TECHWORKS GIVE YOU THE POWER TO PERFORM
VISA, MC, AMEX, DISCOVER, E.O.B., PRE-PAID, AND APPROVED PO'S ACCEPTED    
CIRCLE 166 ON READER SERVICE CARD



*It'll always perform,
or we'll replace it free.*



*Technical Support? We're
here to help you. At no charge.*



*Don't like it? Return it.
It's just that simple.*



*Problem? We'll replace
it via overnight delivery.*



Cash-back for most SIMMs.



Outrageous Customer Service.

POWER



SoundPro P-54

Our SoundPro just got more powerful!

\$2345 Or Lease For \$92/Month*

SoundPro P-54 Dual Scan
Intel Pentium® P-75 CPU 8MB RAM/340MB HD

\$2945 Or Lease For \$115/Month*

SoundPro P-54 Active Matrix
Intel Pentium® P-75 CPU 8MB RAM/340MB HD

- Powerful Intel Pentium® 75, 90 or 100MHz CPU's
- Available in 10.4" Dual Scan or Active Matrix Color 6.6 lbs
- 8MB RAM - Upgradable to 16 or 40MB's
- Local Bus Video & Local Bus HD I/O with built-in 256k cache
- Over 3 Hours of Battery Life
- Ports: 1 16550 High Speed Serial Port, 1 Parallel, 1 Video, 1 Keyboard/Mouse, 1 Docking Station, Audio in/out
- Removable Hard Drive Up to 1 Gigabyte Capacity
- Includes AC Adapter, NiMH Battery, Carrying Case, MS DOS 6.22 & Windows for Workgroups 3.11 or Windows 95*
- Options: Docking Station, Internal 14.4/14.4 Fax-Modem, Car Adapter, External Battery Charger, Extra Batteries
- **Sound System Upgrade: \$125.00**
Includes: External Speakers & Microsoft Sound System Software
- **Upgrade to P-90 for \$225.00 or P-100 for \$375.00**

MediaPro II

This portable has a built-in CD ROM!

\$2695 Or Lease For \$106/Month*

MediaPro II Dual Scan
DX4™-75, 10.4" Dual Scan Color, 8MB RAM/340MB HD

\$3325 Or Lease For \$123/Month*

MediaPro II Active Matrix
DX4™-75, 9.5" Active Matrix Color, 8MB RAM/340MB HD

- CPU options: Intel DX4™ 100 or 75MHz
- Built-in double speed CD ROM supports 5.25" CD's Removable for Dual Battery Support
- Base 4MB RAM upgradable to 32MB
- Removable Hard Drive Up to 1 Gigabyte Capacity
- Available in 10.4" LCD Dual Scan or 9.5" Active Matrix Displays
- Accelerated 32-bit VESA Local Bus Video w/ 1MB V-RAM
- Supports PCMCIA - 1 Type IV or 2 Type II or 1 Type III & 1 Type II
- 16-bit Stereo Sound - SoundBlaster™ & SoundBlaster Pro™ Compatible
- Built-in Trackpoint
- Ports: 1S, 1P, VGA, Floppy, Audio in/out & Midi/Joystick
- Weight: 6.4lbs. Including Battery
- Includes: MS DOS 6.22, Windows for Workgroups 3.11 or Windows 95*, NiMH Battery, AC Adapter & Carrying Case.
- **Optional Multimedia Bundle: \$185.00**
Includes: 6 Software Titles including 4 CD's, External Speakers & Microsoft Sound System Software

SoundPro

Now the clear winner with sound module and local bus I/O.

\$1895 Or Lease For \$74/Month*

SoundPro Dual Scan
DX4™-75 4MB RAM/340MB HD

\$2495 Or Lease For \$98/Month*

SoundPro Active Matrix
DX4™-75 4MB RAM/340MB HD

- CPU options: Intel DX4™-100 or 75MHz
- Available in upgradable 9.5" Active Matrix, Dual Scan Passive or Monochrome Displays
- 6.3 lbs. Color, 5.9 lbs. Monochrome
- 4MB RAM, 1 44MB Floppy
- Local Bus Video & Local Bus HD I/O
- Over 3 Hours of Battery Life
- Removable Hard Drive Up to 1 Gigabyte Capacity
- Includes AC Adapter, NiMH Battery, Carrying Case, MS DOS 6.22 & Windows for Workgroups 3.11 or Windows 95*
- Options: Docking Station, Internal 14.4/14.4 Fax-Modem
- **Sound System Upgrade: \$125.00**
Includes: External Speakers & Microsoft Sound System Software
- **Upgrade to DX4™-100 for \$100.00**

"If you're looking for a fast, affordable computer, look no further."

-Laptop Buyer's Guide and Handbook, 5/95

"No doubt about it, AMS is a tough contender among power mobiles."

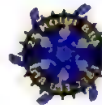
-PC World, 3/95



Money Back Guarantee
If for any reason you are not completely satisfied with your AMS Notebook Computer, just return it within 30 days and we will promptly refund your money**



Lifetime Toll Free Technical Support
Your use of the computer doesn't stop after your warranty expires and neither should your support. We're there to assist you, toll-free, for as long as you own your AMS computer



24 Hour BBS
No matter where you are, no matter the time of day, AMS is just a phone call away with full support services via our 24 hour Bulletin Board System.



*AT&T Capital Based on 36-month lease with 10% purchase option. Sales tax and shipping are additional. Rates subject to change without notice. Leasing is provided by AT&T Capital for qualified commercial purchasers. Call for details.
**All trademarks and trade names are the property of their respective companies. Intel and Intel Inside are registered trademarks and Pentium is a trademark of Intel Corporation. Not responsible for errors in advertising.
***Money Back Guarantee, S/H and open software are non-refundable. Prices and specifications are subject to change without notice.
Upgrade to Windows 95 for \$99.00. Subject to availability from Microsoft.

DRIVEN

Power CD 8300

Multimedia has reached
a new level.

\$2925 Or Lease For
\$115/Month*

Power CD Dual Scan

Intel Pentium® P-75 CPU 8MB RAM/340MB HD

\$3650 Or Lease For
\$135/Month*

Power CD Active Matrix

Intel Pentium® P-75 CPU 8MB RAM/340MB HD

- Internal 5.25" Double-Speed CD. Supports CD-ROM and CD Audio
- Choice of Intel 3.3v Pentium® Processors, 75, 90 or 100MHz
- 10.4" or 11.3" LCD Available in Dual-Scan Color or Active Matrix Color Displays
- 16-bit Stereo Sound - SoundBlaster™ & SoundBlaster Pro™ Compatible
- Advanced PCI Local Bus Interface
- Built-in TouchPad
- Supports PCMCIA 1 Type III or 2 Type II Cards
- Removable Hard Drive (340MB to 1 Gigabyte)
- 8MB RAM expandable to 40MB
- Built-in SIR Infrared Interface
- Built-in 1.44MB Floppy Drive
- Ports: 1S, 1P, 1VGA, 1 Keyboard, Modem & 2Audio in/out
- 1MB VRAM, Upgradable to 2MB
- Over 3 Hours of Battery Life
- 7.1 lbs. including battery
- Includes Microsoft DOS & Windows for Workgroups 3.11 or Windows 95, NiMH Battery, & Carrying Case
- Optional Port Replicator or Multimedia Docking Station
- **Optional Multimedia Bundle: \$185.00** Includes: 6 Software Titles including 4 CDs, External Speakers & Microsoft Sound System Software
- Upgrade to Pentium® 90 for \$295.00



**PENTIUM
CD**



At **AMS**, customer concerns are number 1 on our list. We know that if we don't take care of our customers, someone else will. That's why we have one of the best service-oriented staffs available to you today. Even if you're just shopping, we're more than happy to give you all the information you need. By phone, by mail or with our fax-back service, we can get all of your general and technical questions answered immediately. We understand that notebooks are an investment, so think of us as your personal investment consultant. **AMS'** toll-free tech support, available Monday through Saturday, and 24 hour bulletin board service, provide unparalleled assistance for the life of your notebook.

At AMS, we're paving the way for the future of Notebook Computing.



Optional Multimedia Bundle - \$185.00

Bundle Includes Microsoft Sound System and Portable Speakers Plus Six Software Titles:

- ◆ MS Works CD - Multimedia Version
- ◆ MS Musical Instruments CD
- ◆ MS Money - On 3.5" disk
- ◆ MS Encarta CD - Multimedia Version
- ◆ MS Ancient Lands CD
- ◆ MS Entertainment Pack - On 3.5" disk

TO ORDER CALL

800-868-8108

MONDAY THRU FRIDAY 6:00 am - 6:00 pm SATURDAY 9:00 am - 3:00 pm PST

Corporate, Dealer & Government Pricing Available

FedEx



CIRCLE 235 ON READER SERVICE CARD

**AMS
DIRECT**

The Power To Go

12801 Ramona Blvd., Irwindale, CA 91706
Tel: 818/614-8851 Fax: 818/614-0782

WINDOWS 95

MIDWEST COMPUTER WORKS

✓ Wide Selection ✓ Knowledgeable Sales Staff ✓ On-Time Delivery

YOU'RE OUR TOP PRIORITY!
If you're not happy, we're not happy. We have taken a vow to provide you with the best prices, service and selection possible.

Polaroid

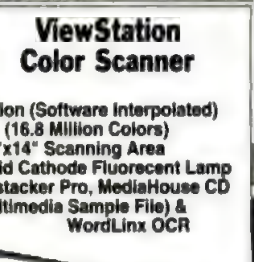


Fastest 35mm Scanner!

- Max. 2700dpi Optical Resolution
- 24-bit Color • Scans in under 60 sec.
- Full-Color Preview

IN STOCK NOW!! \$1999

Artec ViewStation Color Scanner



- 2400 dpi Resolution (Software Interpolated)
- 24-bit True Color (16.8 Million Colors)
- LCD Panel & 8.5"x14" Scanning Area
- Long Lasting Cold Cathode Fluorescent Lamp
- Software: Photostacker Pro, MediaHouse CD (500MB Free Multimedia Sample File) & WordLinx OCR

BEST OF COMPUTERS BYE

AWARD WINNING MEDIAHOUSE SOFTWARE!

\$429

Artec ViewScan Color Handheld Scanner

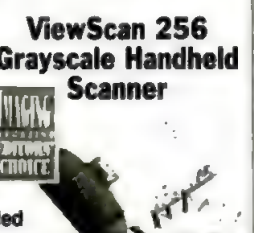


- 100-600 dpi
- 24-bit Color
- 256 Grayscale
- TWAIN Compatible
- Software: Photostacker Pro & G0-CR 2.1

Realistic Images at a reasonable price!

\$159

Artec ViewScan 256 Grayscale Handheld Scanner



- 100-400 dpi
- 256 Grayscale
- Interface Included
- PhotoFina & G0-CR 1.1
- Missing line compensation, MagicStitch & TWAIN compatible.

24-Hour FAX Line 1-708-459-6933
International Line 1-708-459-6884
Customer Service 1-708-459-9410
Technical Support 1-708-459-9411

ORDER DEPARTMENT
1-800-859-6757

COMPUTERS

AST

Wysc Terminals

Bravo LC 286 100 270M 8M	1260
Bravo LC 286 100 540M 8M	1565
Bravo MS D34 100 540M 8M	1599
Bravo MS Pentium 100 540M 8M	2219

Canon

Proline DX2100 286 100 270M 8M	1240
Innova DX4100 850M 8M 4X CD 14 FAX	1380
Bravo Pentium 100 540M 8M 4X CD 14 FAX	1929
Innova Pentium 100 1.3G 8M 4X CD 14 FAX	2389

COMPAQ

COMPAQ AUTHORIZED SERVICE CENTER

Proline DX250 420M 4M ISA	1109
Proline DX4100 420M 8M PCI	1719
Proline DX4100 420M 8M PCI w/CD-ROM	1899
Proline P-500 420M 8M PCI w/CD-ROM	2485
Proline Pentium 100 420M 8M PCI	2229
Proline Mini-Towers	New Models In Stock
Desktop P-575 420M 8M PCI w/Enet	1869
Desktop P-575 420M 8M PCI w/Enet	2099
Desktop XE SX33 270M 4M ISA	1049
PROLiant 300 & 500 Series	BEST PRICES
PROSILICA Series	BEST PRICES

IBM

PC300DX4 100 540M 8M	1520
PC350 DX4100 540M 8M	1829
Performance VP DX250 540M 4M	1329

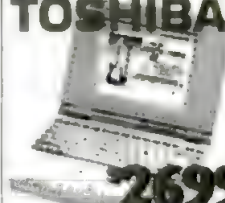
PERFORMANCE NOTEBOOKS VALUE PRICED!

IBM ThinkPad 755C



3525 340MB
Preinstalled with DOS 6.3, Windows 3.11, Lotus Organizer, FaxWorks 3.0, America On-Line.

TOSHIBA



2699
Satellite Series 12100CT
4MB/220MB
20MB Hard Drive
10.4" Standard Color Display

COMPAQ

Contura 4100
DX2/50C
9.5" Pk Color
350MB HDD, 4M RAM
PCMCIA
Local Bus Video
3.5-5.5 hrs. Battery

\$1969

Canon 100MHz Pentium Multimedia Mini-Tower



- Intel Pentium 100MHz
- 1.3GB HDD, 8MB RAM
- Quad-Speed CD-ROM Drive
- 16-bit Sound Card
- Amplified Stereo Speakers
- 3.5" 1.44MB Floppy drive
- 14 400bps FAX Modem w/ Voice Messaging
- Local Bus IDE HDD Interface w/ 20MB/s
- 256K Cache (upgradable to 512K)
- 5M PCI Video Accelerator

\$2599

MONITORS

GoldStar

Goldstar 1455DL 14" 1024x768 28mm	198
Goldstar 1271 17" 1280x1024 28mm	630

MITSUBISHI

Diamond Pro17FS 17" 1280x1024 28mm	899
Diamond Pro17TX 21" 1600x1200 30mm	1879

NEC

MX17F 17" 1280x1024 28mm	649
MX17E 17" 1280x1024 28mm	899
MX21F 21" 1600x1200 28mm	1099

NOKIA

449E 15" 1280x768 28mm	449
447L 17" 1280x1024 28mm	899
447X 17" 1600x1200 25mm	1019
445X 21" 1600x1200 25mm	2149

SONY

NOW IN STOCK!!

CPD1425 14" 1024x1056 25mm	289
CPD155F1 15" 1280x1024 25mm	489
CPD175F1 17" 1280x1024 25mm	829
GDM 175E1 P 17" 1600x1200 25mm	1059
GDM 205E1 20" 1600x1200 30mm	1839

ViewSonic

Economy Series - For Small Businesses

V15E5 15" 1024x768 28mm	369
V15G5 15" 1280x1024 27mm	429
V17G5 17" 1024x768 28mm	779

Professional Series - Ideal for CAD

V17P5 17" 1024x768 28mm	879
V20P5 20" 1024x768 28mm	1499
V15G5 15" 1280x1024 27mm	512
V17G5 17" 1280x1024 27mm	689

PERIPHERALS

BATTERY BACKUPS APC

BK2808/BK4008/BK4500	99 145 178
BK6000/BK9000/BK12500	239 345 449
AP4500/AP5500/AP6500/AP7500	299 399 499 599
AP1250/NET AP2000/NET SmartUPS	444 1025
Line-R 600 1250 UPS 220V	119 169 CALL

TAPE BACKUPS

Mountain Tape Drives
Comstar Tape Drives

250 350 700
PowerTap 1GB 2GB 4GB 8M

133 159 235 349

PLottERS

Calcomp Designstar 3024S 1440
HEWLETT PACKARD ALL MODELS
HP 220 D-size 1999
Packer Data Pro Tracer J & G size 999
Summagraphics ALL MODELS AVAILABLE

SCANNERS

Antec ViewScan Color Handheld 600dpi 69
Antec ViewScan Color Handheld 600dpi 69
Antec ViewStation Color Flatbed 2400dpi 429
AGFA Scanners All Models CALL NOW
Avec 2400 Designer 779
Relays 2412 is Photoshop Trans 479

HEWLETT PACKARD

ScanJet IIP grayscale	489
ScanJet IIC Color	945

MICROTEK

ScanMaster IIC 64M w/Compag Dr	325
ScanMaster IIC Color 1200dpi	459
ScanMaster IIP Color w/ImageStar	525
ScanMaster IIPR H-Res w/Picture Publisher	799
ScanMaster IIP Ultra H-Res 36-Bit w/Photo	2389

VIDEO BOARDS

Heracles Stripper Pro 1MB PCI or VLB 95
Heracles Dynamite & Graphics series Best Prices
Matrox Impression 1.2MB VLB or PCI 309
Matrox Impression 2MB PCI/ISA 389-409
Number 1 GEM64 PCI or VLB 14.2M 179-249
Number 1 200MB PCI or VLB 14.2M 179-249
Orchid Fahrenheit & Keweenaw series Best Prices

DIAMOND

Speedstar Pro PCI & VLB 1MB/2MB	105-145
Speedstar II ISA 2MB/4M	149-197
Speedstar II VLB 2MB/4M	147-197
Speedstar II VLB 4M/8M w/CD-ROM	319
Speedstar II VLB 4M/8M w/CD-ROM	489
Viper Pro VLB or PCI 4M w/CD-ROM	549

MODEMS

Boca Modem 14.4 w/Fax w/Software	80
Boca 14.4 Multimedia Video Modem	125
Boca 28.8 K bps w/Software	174-213
Microcom TrueCard & Desktops all models	CALL
Microcom 194221A 11.2 w/Fax w/Software	119
Microcom 194221A 28.8 w/Fax w/Software	188
Practical 14.4 Mini-Tower	119
Practical V.34 PCMCIA EX200	339
Toshiba FastLoader & NetLoader series	CALL
Toshiba QuickLink TruLink & WorldLink	CALL
Zoom 14.4 w/Fax w/Software	7195
Zoom Pro 14.4 Pocket	189

HAYES

Accura 28.8 w/Fax w/Ext. V.34	189/219
Optima 28.8 w/Fax w/Ext. V.34	289/429
Optima 28.8 EZLink PCMCIA	349

Megahertz

KUHRA KUHRA 14.4 PCMCIA	169
KUHRA KUHRA 28.8 PCMCIA V.34	349
EM11 KAT 14.4 PCMCIA 115T Gombos	389

Robotics

Sportster SL 14.4 w/Fax NEW	65/85
Sportster VL 14.4 w/Fax NEW	115/129
Sportster 28.8 w/Fax w/Ext. V.34	84/110
Sportster 28.8 EZLink PCMCIA	224/239
Sportster PCMCIA 2.1 14.4 w/Fax	179
Sportster PCMCIA 2.1 28.8 w/Fax V.34	349

CPU UPGRADES

386 to 486 CPU Upgrades and Math Ops CALL

ScanJet IIP grayscale 1199/1299
ScanJet IIC Color 1200 dpi 1249

Sprint Scan 35 1999

Vista 5600 w/PhotoShop LE 629
U1200 w/PhotoShop LE 849
PowerLook LE 2400/35 2399

Digitizers

Calcomp Drawing Station 12x12 1800 229
Kulfa 8x11 XGT w/Software 239
Summagraphics 11x12 w/any cursor 289
Wacom Artpad 4.5 w/Double 189

Easy Payment Methods!

Leasing Available • Purchase orders accepted from educational institutions, federal & state agencies and approved corporations. • C.O.D.s welcome.

FedEx
FAST SHIPPING, NO PROBLEM!
WE DELIVER WHEN YOU NEED IT.

Policy Information
• Personal and company checks will only cash within 3 weeks • No cash advance for credit cards • All prices subject to change • For orders outside the USA we require payment by wire transfer to American Express credit card • We check for credit card status • All returns for credit, except for exchange must show a return authorization number issued by your company's service department • All returned merchandise must be in original condition • We guarantee our prices are the lowest in the industry.

✓ Comprehensive Tech Support

Line interactive voltage regulation keeps you working through brownouts. Protects against blackouts, surges and line noise.

- 6 min. at Full Load
- 500volts/350watts

**UNIVERSAL
LIFETIME
INSURANCE**

\$279

Densitak 320/540	295/279	1080/1680	2398/38
Densitak 600C NEW	CALL	MagiColor Laser LX	4815
Densitak 1200/1200PCS	979/154	SH	
LaserJet 4L 40ppm 600dpi	408		
LaserJet SP 5ppm 600dpi NEW	879	Smart Label E230	129
LaserJet SMP 60ppm 600dpi Pictastep	999	Electrolabel Fineline Plus	239
LaserJet 4i 12ppm 600dpi	1369	CH-4104PSE Colorpoint	2423
LaserJet 4aa 12ppm 600dpi	1948		
LaserJet 4i 16ppm 600dpi "12"	1899	TETAS	
LaserJet 4M 16ppm 600dpi "12"	2588	INSTRUMENTS	
LaserJet 4Si 17ppm 600dpi	2699	microlaser Pro 500 ppm 600dpi NEW	829
LaserJet 4SiMXL 17ppm 600dpi	4179	microlaser Pro 600 PPS 23 600dpi	1349
Color LaserJet	5699	microlaser Pro 600 PPS 600dpi	1819
Official		microlaser PowerPro 12ppm 600dpi	1599

CD-ROM DRIVES		REMOVABLE STORAGE	
Cronen CD-8454SI w/ 230ms EIDE int.	185	Kiomega Multidisk 150 Inside	360
NEC BX1 6X/E	459/555	Kiomega Zip 100MB SCSI Par Port	190
NEC SuperSap 300 Portable		Fujitsu Dismount 230 int.	280
Melway Video Range Ext	273	Olympus Demote 1.3GB ext int	160
Microsculptors 4X Par Port	349	Pil Infinity 270 int	149
Panasonic KX-KD-D720 Portable	295	Panasonic LF 730H 1.5GB int	212n
Pioneer 18 Disk Charger	208n	Panasonic Micro Tape 230M ext int	92n
Reveal 2X	136	Panasonic Micro Sierra 1.3GB PC int	299n
Titanium XA 6600 1D 4X 150ms ext	319	Sony SMOF215T 1.5GB 5.25" int	177n
Titanium XA3000 1B 4X 150ms ext	419	Sony RM05705 Rewrite 1.3GB 5.25" ext	175n
		Singet 200MB Value kit int	56n
PINNACLE MICRO		HARD & FLOPPY DRIVES	
Pinnacle Micro Rec. CD-ROM int. kit	188n	Maxtor F1R504 130 IDE	33n
Pinnacle Micro Rec. CD-ROM ext. kit	179n	Micrologix 4221 AV 2 1 GB SCSI	630
		Micrologix 325 2GB SCSI	147n
		Micrologix 1981W 1GB SCSI	230n
		Microsculptors Supertrak 1.2 I.B. Par	90n
		Quantum FB540 540MB SCSI	260
		Quantum FH120 120MB SCSI	400
		Quantum FH120 120MB SCSI	400
		Seagate ST506 506MB 5.25"	99n
		Seagate ST506 506MB 5.25"	99n

Sony CDU35C 2x 220ms EIDE int	116	Sony 1-44MB 5 1/4" floppy	49
Sony CDU55S 2x 220ms SCSI-2 ext	154	Maxtor 200MB 5 1/4" floppy	149
Sony CSD780E 4x EIDE int hd	209		
Sony CSD780S 4x SCSI-2 ext hd	269	CONNER	
Sony CD-ROM Decima 2x port int	369	Conner 4x 425MB IDE	165
Sony Spressia 920 Rec CD int	1598	Conner 4x 1.2GB IDE	359

Lantrastic V6.0 1-user/5-user	79/329	Dynalnet I/ST Print Server 1000 LaserJet 4	69
Lantrastic V6.0 Network Starter Kit	229	Dynalnet EX external print server	69
Modemrunner SI 2000 coax or 10BT	76		
Modemrunner 2000 coax or 10BT	169		
ALL MODELS IN STOCK.....CALL TODAY!			
EtherExpress 16 coax or 10BT	89	Anchor PC130 PC270E	69
EtherExpress 16 V16 coax or 10BT	89	Anchor PC600 Workstation Firewall	119
EtherExpress Pro Flash coax or 10BT	111	Anchor PG60E Workstation Firewall	119
		Anchor Hub 8-port active	69
		Emul 16 Ultra Ethernet coax or 10BT	89
		Emul 16C Ultra Ethernet COMBO coax or 10BT	89
		Emul 16 Ultra Ethernet coax or 10BT	89

N	NOVELL	FREE SHIPPING
NetWare SPT 311	BEST PRICE CALL	
NetWare 3.12 8-user	549	
NetWare 3.12 10-user	1229	
NetWare 3.12 25-user	1729	
NetWare 3.12 50-user	2169	
NetWare 3.12 100-user	SPECIAL PRICING	
NetWare 3.12 250-user		
NetWare 4.1 5-user	559	
NetWare 4.1 10-user	1279	
NetWare 4.1 25-user	1789	
NetWare 4.1 50-user	2249	
NetWare 4.1 100-user	3499	
NetWare 4.1 250-user		
NetWare 4.1 500-user	PRICE LEADER!	
NetWare 4.1 1000-user		
		WITH ALL NOVELL NETWORK UPGRADES!
DOS 7.0 * Personal Netware	40/99	
GroupWise	IN STOCK CALL	
Personal Netware 5-user	289	
Unimarc Actix Server 1 1 CD . . .	849	
Unimarc Personal Edition 1 1 CD .	169	
ManageWise Vti 10-user	929	
NetWare Backup/Restore services 1K		
Netware Connect Vti 10-user . . .	1499	

Ethernet 10/100 PoE Combo class 4 10BT 205
 Ethernet 10/100 **10, 20 and 30-pairs SAVE 5%**
 Ethernet Concentrator 10BT 8-port 240
THOMAS•CONRAD
 TC3045-CK 100Mbps ISA card 438
 TC3046-CK 100Mbps ISA card 438
 TC3047-UT 100Mbps EISA UTM RJ45 439
 TC3047-UT 100Mbps EISA UTM RJ45 439
 TC3414 Token Ring 16Mbps PCMCIA 439
 Creditcard IPS Ethernet 10BT 440
 Creditcard IPS Ethernet 10BT 440
 Creditcard IPS Ethernet token ring 440
 Creditcard Ethernet 10BT & 14 4 Modem 440
 Creditcard **8 and 30-pairs SAVE 5%** 440
 Pocket Ethernet 10BT 10 or 10BT 441
 Pocket Ethernet Token Ring Server Class 4 10BT 441
 Pocket Token Ring 10 441

2309-36	8MBx3670 72-pin...32MB CALL	ProLine
4815	Toshiba T2450 8MB.....349	Contur
230		
Intel Pin		
Colorprint		
230		
2423		

LIFETIME WARRANTY!!!!

All major brands of computer and printer memory supported such as: Compaq, AST, HP, IBM, Toshiba, NEC, Canon, Texas Instruments, DELL and more!

* All memory prices subject to change due to the volatile nature of the

ABLE STORAGE	
ct 150 Insider	306
AMB SCSI/Par Port	199
230 int	549
1 3GB ext kit	1649
int	489
240 1 5GB int	2129
Tahoe 230M ext kit	929
1 3GB PC int	2399
1 5GB 1.25" int	1749
1 5GB 2" int	1979
Value kit int	569
FLOPPY DRIVES	
120 TIDE	339
AV 21 6GB SCSI	1699
4 3GB SCSI	2479
W 8 GB Wds	1399
SCSI 1.2-Par 899	
540MB SCSI	209
int 1 6GB kit	1169
1 6GB int	269
1 6GB int	999
WINDOWS 95 Upgrade Version	
WINDOWS 95 Full Version / CD	
Bookshelf CD Version	
Works Full Version	
Works w/Bookshelf CD Version	
Access Upgrade Version / Full Vers.	
Excel Upgrade Version / Full Version	
Office Standard Upgrade/Full	
Office Standard CD Upgrd/Full	
Office Professional Upgrd/Full	
Powerpoint Upgrade/Full	
Project Upgrade/Full	
Schedule + 32 Full Version	
Plus Full Version / CD Version	
Word Upgrade Version / Full Version	
Small Business Pack for Office 95	

425MB IDE	165
1 2GB IDE	359

8MBx3670 72-pin...32MB CALL
Toshiba T2450 8MB349 ProLinea 8MB355
Centura 410 4MB199

LIFETIME WARRANTY!!!!

All major brands of computer and printer memory supported such as: Compaq, AST, HP, IBM, Toshiba, NEC, Canon, Texas Instruments, DELL and more!

All Memory Shipped OVERNIGHT FREE!

* All memory prices subject to change due to the volatile nature of the market.

WINDOWS 95 Upgrade Version	89
WINDOWS 95 Full Version / CD	189 / 98
Bookshelf CD Version	62
Works Full Version	44
Works w/Bookshelf CD Version	69
Access Upgrade Version / Full Vers.	95 / 308
Excel Upgrade Version / Full Version	98 / 305
Office Standard Upgrade/Full	229 / 463
Office Standard CD Upgrd/Full	230 / 458
Office Professional Upgrd/Full	323 / 561
Powerpoint Upgrade/Full	95 / 308
Project Upgrade/Full	137 / 440
Schedule + 32 Full Version	81
Plus Full Version / CD Version	43 / 43
Word Upgrade Version / Full Version	94 / 308
Small Business Pack for Office 95	91

Easy to use! Powerful!
DesignCAD's BasicCAD programming language is Included FREE! Allowing

- Material List
- Dimensioning
- Drafting & Editing
- Toolboxes
- Supports 7 File Formats
- Scaling & Zoom
- Layers
- Material List
- Macros
- DOS Version Available

Lowest Price Ever!

\$162

DESIGNCAD

for Windows!

2D

COMPUTER WORKS

(1-800-859-6757)

CIRCLE 910 ON READER SERVICE CARD

Pentium® Processor

Power at low

CompUSA prices.

Save big by calling CompUSA Direct™

CompUSA Direct™ is the fast, easy way to buy computer products

because we put the nation's largest Computer

Superstore® at your fingertips! Just check out these

unbeatable prices on the latest technology. Our free

catalog lists over 5,000 computer products, and you

can order 7 days a week, 6 am to 1 am CST!

CompUSA service representatives are eager to help.

So for guaranteed low prices* on today's

best computer products, call

1-800 COMP USA.



COMPUDYNE

100 MHz Pentium® Processor

- 8 MB RAM • 1.06 Gig Hard Drive
- 3 1/2" Floppy Drive
- Quad-Speed CD-ROM Drive
- 1 MB PCI Video • Mouse
- 16-bit Sound • Stereo Speakers
- 14.4 Fax/Modem • Keyboard
- MS DOS 6.22 • Windows 3.11
- America Online

#646523 (Monitor sold separately. Software is preloaded. Manuals not included.)

\$2399⁹⁹

Business lease only \$29/mo.^A

Toshiba T2155CDS Multimedia Notebook

- 75 MHz IntelDX4
- 4 MB RAM • 500 MB Hard Drive
- 3 1/2" External Floppy Drive
- Double-Speed CD-ROM Drive
- 16-bit Sound • Speaker • Microphone
- 1 MB Local Bus Video
- 10.4" Dual-Scan Color Display
- 1 Type III or 2 Type II PCMCIA Slots
- MS-DOS 6.22, Windows 3.11, Video for Windows, Windows Sound, Multimedia Help Kit



\$2999⁹⁹

Business lease only \$111/mo.^A

#669042 (\$250 worth of CD titles included. Software is preloaded. Manuals not included.)

Megahertz XJack 28.8 PCMCIA Modem #615822 \$399.99

Compaq Prolinea 466 DX2/66 #670911	1599 ⁹⁹
Compaq Desk 4100 DX4/100 #670955	1899 ⁹⁹
Epson 660C 486 DX2/66 Notebook Computer #676575	1899 ⁹⁹
Acer 782 486 DX4/75 Notebook Computer #666522	1899 ⁹⁹
TI TM4000M 486 DX2/50 Notebook Computer #619575	1999 ⁹⁹
Compaq Desk 75 MHz Pentium® Processor #670973	2199 ⁹⁹
Acer 784 486 DX4/75 Notebook Computer #670374	2299 ⁹⁹
IBM 300 DX4/100 #659961	2349 ⁹⁹
Digital Celebris 90 MHz Pentium® Processor #587092	2499 ⁹⁹
Apple® Power Macintosh™ 7100 #638091	2729 ⁹⁹
IBM 700 90MHz Pentium® Processor #699950	2899 ⁹⁹
Canon Innova 200LS DX4/100 Notebook Computer #639682	2999 ⁹⁹

*If you find a lower price on a product in this ad in the current issue of this magazine we'll beat it. Guaranteed. Offer good on all new in-the-box products of the same brand and model number that are available in stock from any other authorized mail order competitor. It does not apply to competitors' misprints, one-of-a-kind or other limited quantity offers or when a bonus or free offer is included in the purchase. CompUSA Direct prices are available through mail order only and are valid until the next issue of this magazine, or 30 days from the date of this issue, whichever comes first. Prices and specifications are subject to change without notice. We reserve the right to limit quantities. All Hayes modems and laser printers, and some other printers, monitors and laptops must be sent to authorized service centers. Due to manufacturers' restrictions, certain products may not be eligible for international shipment. Apple products not available via mail order. The Intel Inside and Pentium Processor logos are registered trademarks of the Intel Corporation. CompUSA and The Computer Superstore are registered trademarks, and CompUSA Direct is a servicemark of CompUSA Inc. CompUSA Direct, 15167 Business Avenue, Dallas, TX 75244. Defective merchandise may be replaced with the same item only. We want you to be satisfied with your purchase. If for any reason you are not satisfied, please return the item within 30 days with original receipt or invoice. Opened software may be returned for exchange only. A 15% restocking fee may apply to return items; call or see store for details. All refunds in excess of \$250 will be sent via check from the CompUSA corporate office within 10 days. ^ALeasing arranged by Leasing Group, Inc. For business use only. Prices based on 36-month, open-end lease, 10% purchase option. ^{**}Certain restrictions apply on upgrade software. ©1995 CompUSA Inc.



NEC XE15
15" .28 NI

\$569⁹⁹ #600701



Novell PerfectOffice
Upgrade/Win.

\$186^{99}** #636634



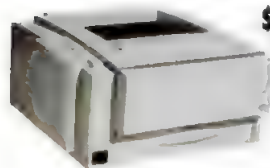
Sidekick
Deluxe CD

\$49⁹⁹ #100065

MONITORS

Compudyne 15" .28NI #289690	329 ⁹⁹
Compudyne 17" .28NI #588171	679 ⁹⁹
NEC XV17 17" .28 SVGA #648320	799 ⁹⁹
NEC XE17 17" .28 SVGA #611163	999 ⁹⁹
Nokia 17" .25NI Trinitron Monitor #474953	999 ⁹⁹

HP LaserJet 5P Printer



\$899⁹⁹
#666631

PRINTERS

Epson FX-1170 132-Column Dot Matrix #938542	399 ⁹⁹
HP LaserJet 4+Printer #316152	1449 ⁹⁹
Lexmark Optra R Printer #636781	1449 ⁹⁹
HP DeskJet 1200C/PS Printer #486154	1699 ⁹⁹
HP LaserJet 4Si Mx Printer #486063	4299 ⁹⁹



Creative Labs
4X Discovery
CD Multimedia Kit
with 18 Titles

\$369⁹⁷ #649983

MULTIMEDIA

Labtec CS-600 Speakers #49464	34 ⁹⁹
Reveal 4x Internal IDE CD-ROM Drive #647012	199 ⁹⁹
Creative Labs Phone Blaster 14.4 #708434	249 ⁹⁹
U.S. Robotics 28.8 V.34 Internal Fax/Modem #520083	259 ⁹⁹
Creative Labs Sound Blaster 32 AWE #302174	298 ⁹⁹

WINDOWS SOFTWARE

Quarterdeck Clean Sweep #630193	29 ⁹⁹
WIN CheckIt #520163	49 ⁹⁹
Quicken Deluxe 4.0 #578672	59 ⁹⁹
WinFax PRO 4.0 #294492	73 ⁹⁹
WordPerfect 6.1 Upgrade #580592	86 ⁹⁹
Spanish Power Translator #268833	99 ⁹⁹
MS Access 2.0 Upgrade #297974	118 ⁹⁹
Lotus SmartSuite 3.1 Upgrade #675994	239 ⁹⁹
40 Mail-in Rebate	40 ⁹⁹
	199 ⁹⁹
ACT! 2.0 #321202	199 ⁹⁹
MS Office 4.2 Upgrade #281885	239 ⁹⁹
MS Office Pro 4.3 Upgrade #308054	349 ⁹⁹



Soft RAM for
Windows

\$59⁹⁹ #665983

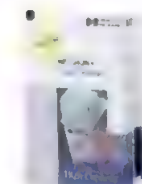
Double your memory!

DOS SOFTWARE

MS DOS 6.22 Upgrade #338611	47 ⁹⁹
QEMM 7.5 #599920	69 ⁹⁹
IBM PC DOS 7.0 #664274	78 ⁹⁹
MS Works 3.0 #127160	99 ⁹⁹
Lotus 1-2-3 4.0 Upgrade #356921	99 ⁹⁹
Norton Utilities 8.0 #294835	119 ⁹⁹

ACCESSORIES

3M 3 1/2" DS/HD Formatted Diskettes #43163	5 ⁹⁹
3 Mail-in Rebate	3 ⁹⁹
	2 ⁹⁹
Canon Hi-Capacity Black Ink Cartridge #667051	9 ⁹⁹
Microsoft Serial Mouse 2.0 #574402	49 ⁹⁹
HP LaserJet 4L Toner #945763	54 ⁹⁹
Microsoft Natural Keyboard #574550	89 ⁹⁹



HP Hi-Capacity
Black Ink Cartridge

25⁹⁹

Instant
Rebate

-6⁰⁰

19⁹⁹ #481661

Limit 12 per customer, offer expires 8/31/95



• Over 900 Memory Products
for more than 60 brands
of PCs, Notebooks,
Subnotebooks, Workstations
& Laser Printers.

• Plus, a huge selection of special order items
available through CompUSA Direct.

• Lifetime Warranty on all products.

• Toll Free Tech Support: 1-800-643-3255

ORDERING IS FAST AND EASY!

Order 7 days a week, 6am - 1am CST

CompUSA is ready to take your order... and get it to you as quickly and conveniently as possible.

Special orders Available!

Over 25,000 products.

Call for a free catalog.

To place an order or for a free catalog listing over 5000 computer products call 1-800-COMP USA and select option 3.

Fax orders welcome!

You can fax your order anytime! Fax 1-800-FAX-2212

Standard Delivery

For a nominal fee, we'll ship your order anywhere in the world within 5 to 7 working days. Restrictions apply.

Next-day Delivery.

We'll ship your order for delivery by the following day (except Sundays). Additional delivery charges apply.

Technical Support Hotline 1-900-896-9393

\$2.49 per minute, first minute free. Available M-F 8-9, Sat. 9-6, Sun. 12-6, CST. We can answer your questions, even if your computer products were purchased somewhere else.

Government Hotline 1-800-468-4682

GSAM GS00K95AC86319

International Orders: 1-214-888-5770

International Fax: 1-214-888-5760



PHONE SERVICE MENU:



to order by mail



for store or corporate sales



to join our mailing list

COMPUSA DIRECT

1-800-COMPUSA

(1-800-266-7872)

CIRCLE 144 ON READER SERVICE CARD

MEM RY

FACTORY DIRECT PRICES

**CALL MICRON
MEMORY DIRECT!**

Our knowledgeable
sales staff will put you
on the road to **POWER!**

1 X 8.....	call
1 X 9.....	call
4 X 8.....	call
4 X 9.....	call
1 X 32.....	call
1 X 36.....	call
2 X 32.....	call
2 X 36.....	call
4 X 32.....	call
4 X 36.....	call
8 X 32.....	call
8 X 36.....	call

MAC UPGRADES ALSO AVAILABLE

- FACTORY DIRECT PRICING
- 30-DAY MONEY BACK GUARANTEE
- INSTALLATION INSTRUCTIONS INCLUDED
- SAME DAY SHIPPING
- U.S.A. MADE QUALITY AND RELIABILITY
- VISA, MC, AMEX ACCEPTED

MICRON
ELECTRONICS, INC.

800-219-2283

MON-FRI 7AM - 6PM / SAT 9AM-3PM (MT)
915 E. Karcher Road • Nampa, Idaho 83687
FAX (208) 465-1740 Purchase Order FAX (208) 465-1740

©1995 Micron Electronics, Inc. All rights reserved. All prices and specifications subject to change without notice. Micron Electronics, Inc. cannot be responsible for omissions, errors in typography or photography.

CIRCLE 203 ON READER SERVICE CARD

Get answers every day a spreadsheet can't give you any day

Real Stats. Real Easy.

Now
available on
Windows
NT

Use SPSS 6.1 for Windows when you need in-depth answers quickly and easily. Go beyond summary statistics and spreadsheet row-and-column math by using the right tool for the job. SPSS is a complete tool kit of statistics, graphs and reports that enables you to answer tough questions like:

- How satisfied are my customers?
- What will sales be next quarter?
- What are the patterns in my data?

SPSS products are used today for:

Survey research of all types

- Explore consumer awareness
- Compare perceptions of products
- Discover preferences by group

Marketing and sales analysis

- Analyze your customer database
- Forecast sales by product and region
- Improve mailing responses
- Learn which promotions work best

Quality improvement

- Assess process capability
- Reduce nonconformance
- Spot unnatural patterns of variation
- Track incidence of infection

Research of all types

- Test hypotheses
- Determine group differences
- Track performance over time
- Prepare professional reports

Answer your tough questions

You don't need a Ph.D. to learn or use SPSS 6.1 for Windows. A tutorial, task-oriented help and a glossary of statistical terms will help make you an expert. You'll be surprised at how easy it is to do in-depth data analysis.

And, if you are already an expert, you'll appreciate SPSS' rich set of statistical functionality. Whatever your experience level, you'll be able to explore your data thoroughly.

Discover hidden patterns and trends in your data with over 50 high-resolution business, analytical and SQC charts. SPSS saves you time by automatically aggregating your data and labeling your charts. Then, quickly add smoothing lines, confidence intervals and more to tell the full story in your data.

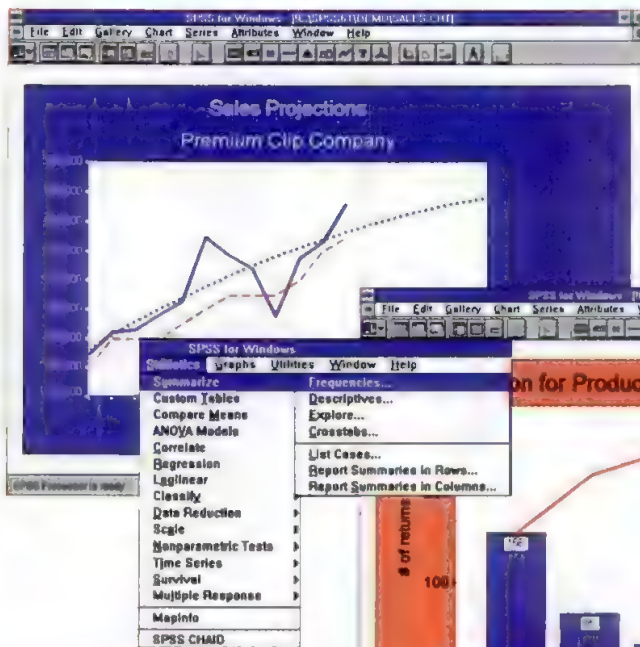
Call today to find out how to answer your tough questions every day with SPSS 6.1 for Windows!

Get a great value -- order now!

1 (800) 543-5833

or Fax: 1 (800) 841-0064

CIRCLE 043 ON READER SERVICE CARD



Complete data management

"SPSS for Windows combines great data management with nearly unlimited data capacity. With the add-on modules, it provides unrivaled statistical range." *InfoWorld*

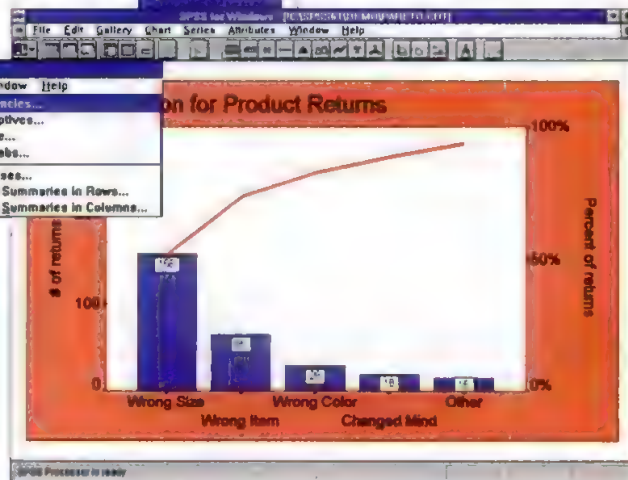
Automatic statistical graphs

"A complete set of graphics and charting capabilities." *PC Week*

In-depth statistics

"For more statistical analysis tools than you'll get from a spreadsheet such as Excel, without the steep learning curve, SPSS for Windows is a great buy." *PC/Computing*

EDITORS' CHOICE
May 11 1993
SPSS 5.0/Windows



Learn fast, work fast

"SPSS for Windows is an excellent full-featured set of statistical procedures...The Windows interface makes it easy and fast to use and I highly recommend it." *Marketing Research*

Reasons SPSS 6.1 for Windows goes beyond your spreadsheet:

- 60+ statistical procedures
- 50+ business, analytical and SQC charts with automatic labels
- New toolbar which gives you one-button access to statistics and commonly used functions
- Technical support for statistical help
- New online tutorial
- Statistical help system
- Glossary of statistical terms
- Fast 32-bit processing
- Hot buttons between graphs and tables
- Work with even your largest data sets
- Complete report writer

- View your data as words, while doing analysis with numbers
- Keep your formulas safe and separate from your data
- ODBC / OLE
- Statistics located in easy-to-understand menus and dialog boxes
- Easy, complete data editing and management in a spreadsheet-like format
- Documentation which clearly explains statistics
- Create charts with your analysis automatically
- Automatic labeling of results

Available add-on modules:

- Explore your data more thoroughly with techniques such as factor, cluster, discriminant analysis and much more with SPSS Professional Statistics™
- Execute advanced multivariate techniques such as Cox regression, Kaplan-Meier estimation, logistic regression and more using SPSS Advanced Statistics™
- Create camera-ready tabular reports with SPSS Tables™
- Predict the future using advanced time-series analysis in SPSS Trends™
- Perform perceptual mapping, conjoint analysis and optimal scaling procedures with SPSS Categories™
- Find predictors and build better models using SPSS CHAID™
- Analyze linear structural equations and simultaneous equation models using SPSS LISREL™

- Improve your operations with statistical process control using QI Analyst™
- Build thematic maps with MapInfo®
- Plug components for stats, graphs and reports, complete with data management and output formatting, into your applications quickly and easily with OLE 2.0 Automation in the new SPSS Developer's Kit™. Provide both push-button statistical reports and interactive data analysis with access to all SPSS features



Get a great value -- order now!

1 (800) 543-5833

Fax 1 (800) 841-0064

or mail to: SPSS Inc.
444 North Michigan Avenue
Chicago, IL 60611

American Express, Discover, MasterCard and VISA accepted

Name _____
Title _____
Organization _____
Address _____
City _____ State _____
ZIP _____ E-mail _____
Phone Number () _____
FAX Number () _____

Try SPSS 6.1 for Windows with our unconditional 60-day money-back guarantee

SPSS
Real Stats. Real Easy.™

A5833

Athens • Bologna • Chertsey • Chicago • Goringham • Herzlia • Madrid • Munich • New Delhi • Paris • Singapore • Stockholm • Sydney • Tokyo • Washington, D.C. • And distributors worldwide

Each PC Connection Hotline Expert is trained by the manufacturer and ready to provide the perfect solutions for you!

Call our DeltaPoint Experts at
800-600-8252

NEW!



SmartDraw SmartFloor SmartPlan

Instant Business Diagramming!

DeltaPoint's new **Drag 'n Draw** includes dozens of libraries with over 1,000 pre-drawn shapes, called SmartDrawings, making it simple for anyone to create professional looking space plans, layouts, schematics, and diagrams.

DRAG 'N DRAW

22045 Drag 'n Draw \$79.95

16820	Iomega Bern 230MB Transportable	\$499.95
19908	Iomega Ditto 420MB Tape Drive	159.95
21612	MDS 2.0GB DAT Drive	999.95
18826	Quantum 540MB IDE Drive	259.95
17345	Western Digital 1GB IDE Drive	479.95

control, all credit card orders phoned in weekdays by 3 a.m. ET will ship Airborne Express for delivery the next business day. (Some orders ship UPS Ground for next day delivery.) Saturday delivery available to many areas upon request at no additional charge. Order all day Saturday thru noon Sunday for Monday delivery. Some areas require an extra day delivery. **AP0/FP0, International orders and Hawaii, Alaska, Canada, Puerto Rico & U.S. Virgin Islands:** Shipping may require additional time and charges. All other areas: Call 803-446-0004 or FAX 803-446-7791 M-F 9 a.m.-5:30 p.m. ET.

SERVICE!

ACCESSORIES

- 3858 APC Back-UPS 400 Power Backup \$149.95
- 9685 APC Professional Surge Protector.....34.95
- 16891 Improve Make-it a 486.....229.95
- 4623 PCC 3.5" Oak Disk Case (holds 90).....35.95
- 1305 Targus Universal Notebk Bk Case.....69.95

- 16320 Borland Paradox—Win. 5.0 Upgd.\$129.95
- 5785 CheckMark Payroll—Windows.....79.95
- 13156 Clear Software allCLEAR—Win.....179.95
- 17007 Gold Disk Video Director—Win.....99.95
- 14922 IdeaFisher—Windows.....95.00
- 6733 Inspiration—Windows.....129.95
- 3517 Intuit TurboTax—Windows.....39.95
- 15978 Lotus Approach 3.0 (w/\$20 rebate)79.00
- 19774 Microsoft Office for Win. 4.2.....479.95
- 17693 Microsoft Win. NT 3.5 Wkstn.....299.95
- 7811 Microsoft Word for Win. 6.0.....299.95
- 19400 MS Works—Win (w/free Money).....87.95
- 18240 Novell Perfect Office 3.0.....449.95
- 5426 Shapeware Visio 3.0—Win.....129.95
- 4402 Soft Pub Harvard Graphics—Win.....279.95
- 10901 SoftKey A H Dictionary Talking CD 38.95
- 7435 Symantec ACT! 2.0 for Windows.....189.95
- 12914 WordPerfect 6.1 for Windows.....279.95

MULTIMEDIA

- 19482 Altec Lansing ACS51.....\$79.95
- 21784 Connectix QuickCam for Windows.....99.00
- 3226 C. Labs Sound Blaster Pro Value Ed.....79.95
- 16899 Diamond Stealth 64.....\$369.95
- 16428 Intel Smart Video Recorder PRO.....429.95
- 17316 Magnavox 17" CM4017 Monitor.....699.95
- 18412 Matrox Impression LITE VLB 2M.....359.95
- 17949 MDS Chinon 525 CD-ROM Drive.....129.95
- 17195 NEC MultiSync XE 15" Monitor.....569.95

GRAPHICS

- 13109 Adobe Illustrator & Photoshop.....\$629.95
- 16661 Adobe Photoshop 3.0.....569.95
- 13791 Aldus PageMaker 5.0.....579.95
- 19112 Canvas/Typestry/DeltaGraph Bun.....329.95
- 2618 CorelDRAW! 3.0 CD-ROM.....79.95
- 8498 CorelDRAW! 5.0 CD-ROM.....499.95
- 7850 Corel Gallery CD-ROM Windows.....39.95
- 16961 Fractal Design Painter 3.0—Win.....349.95
- 19880 HSC Convolver Windows.....129.95
- 13956 HSC KPT Windows.....129.95
- 21994 HSC Vector Effects—Windows.....129.95
- 16427 Macromedia Director—Windows.....899.95
- 1085 Macromedia FreeHand—Windows.....399.95
- 10524 Micrografx ABC Flow Charter.....329.95
- 17800 Micrografx Picture Publisher 5.0.....279.95
- 6992 North Coast PhotoMorph 2.0—Win.....99.95

UTILITIES

- 17808 Central Point More PC Tools—Win \$49.95
- 16440 Central Point XFree Gold—Win.....99.95
- 19989 Connectix RAM Doubler.....54.95
- 14787 MicroHelp Uninstaller 3.0.....39.95
- 3217 Quarterdeck QEMM 7.5.....61.95
- 2360 Symantec Desktop—Windows.....124.95
- 5132 Symantec Norton Ant Virus.....99.95
- 5136 Symantec Norton Utilities 9.0.....124.95
- 10586 Symantec Norton 8.0 Vers Upgrade.....47.95
- 19279 Sytron NeverEnding Disk.....44.00
- 19302 Verisoft Remove-IT 2.0.....34.95

NEW! Portable Printers from Canon!



BJC-70 Color
ONLY

\$369⁹⁵

20670

BJ-30
ONLY

\$269⁹⁵

20669

The BJ-200ex Bubble Jet Printer provides laser-quality 720 x 360 dpi output (with smoothing) at 4 ppm, in a space-saving upright design. Includes 100-sheet feeder and 20 TrueType fonts.

- 15187 BJ-200ex Bubble Jet Printer.....\$249.95
- 10350 BJ-200 Ink Cartridge.....24.95

Canon

BJ-200EX
ONLY

\$249⁹⁵

15187



Call our Canon Experts at 800-600-9148

TOSHIBA's State of the Art Notebook TOSHIBA



ONLY

\$1999

20252

The Toshiba T2100CS

- Portable, powerful, affordable color notebook
- Fast 50MHz Intel486 DX2 Processor
- Built-in power supply and rechargeable battery (no AC adapter required)
- 4MB of RAM expandable to 28MB
- Weighs just 6.8 lbs.
- 10.4" dual-scan color
- AccuPoint integrated pointing device

Call our Toshiba Hotline at
800-600-9142



PC World
World Class Award Winner.
An unprecedented five times!



Boston Computer Society
"Best All Around Company"
2 years in a row!

Call our Lotus Experts at
800-600-8253

Just Announced From Lotus!

THE WORD IS OUT. There's a new way to write. Lotus Word Pro is the team word processor. A new breed of productivity tool designed especially for people whose best work comes from working with others. It does more than help you write. It lets you share, collaborate, work together and, succeed!



Lotus
Working Together

Call our MDS/Lotus Hotline
at 800-600-9137

Hot New Deals!



- MDS 75MHz Pentium
- 540MB Drive
- Multimedia-ready
- PLUS, Lotus SmartSuite

22046 • Connectix RAM Doubler & Verisoft Remove-IT! 2.0 PLUS, FREE Lotus Organizer \$69⁹⁵

Call us for more Lotus bundles!

SMART SUITE

Free Tech Support
Next Day Delivery
Custom Systems
Overnight!

PC Connection®
800-800-0004
OR FAX YOUR ORDER
603-446-7791

895PCM

Insight

America's discount source for

SYSTEMS

IBM

IBM PC and Pentium® Models also feature:

- 1.44MB, 3.5" Floppy Drive
- DOS, Windows and Easy Tools
- 3 Year Manufacturer's Warranty (1 Year On-Site Warranty)

IBM PC Models also feature:

- 486DX2/66MHz or DX2/50MHz Processor
- 4MB or 8MB Standard expandable to 128MB
- 360MB, or 540MB Hard Drive
- VESA Local Bus Video 1MB DRAM
- Local Bus IDE Controller

IBM Pentium® Models also feature:

- Pentium® 75MHz or 90MHz Processors
- 8MB or 16MB Standard
- 540MB or 850MB Hard Drive
- PC Local Bus, 64 bit DRAM

IBM

IBM PC Models

Processor	RAMMD	Slots/Bays	Prod. Code	Price
486DX2/66	8/364MB	3x3	IBA6571L4F	\$1,466
486DX2/66	8/364MB	5x5	IBA6581L4F	1,553
486DX2/66	8/540MB	5x5	IBA6581L5F	1,645

IBM

IBM Pentium® Models

Processor	RAMMD	Slots/Bays	Prod. Code	Price
Pentium® 75MHz	8/540MB	3x3	IBA657635F	\$1,823
Pentium® 75MHz	16/540MB	3x3	IBA657635H	2,168
Pentium® 75MHz	16/850MB	3x3	IBA657637H	2,283
Pentium® 75MHz	8/540MB	5x5	IBA658635F	1,880
Pentium® 75MHz	16/540MB	5x5	IBA658635H	2,225
Pentium® 75MHz	16/850MB	5x5	IBA658637H	2,340
Pentium® 90MHz	8/540MB	3x3	IBA657645F	2,225
Pentium® 90MHz	16/540MB	3x3	IBA657645H	2,570
Pentium® 90MHz	16/850MB	3x3	IBA657647H	2,685
Pentium® 90MHz	8/540MB	5x5	IBA658645F	2,283
Pentium® 90MHz	16/540MB	5x5	IBA658645H	2,628
Pentium® 90MHz	16/850MB	5x5	IBA658647H	2,743

NOTEBOOKS
IBM

Order before 7/31/98
and get a free 4MB
upgrade and 14.4/14.4
data/fax PC Card Modem



IBM ThinkPad 755C features:

- 486DX2/50 or 486DX4/75 Processor
- 10.4" Active Matrix Color Display
- 4MB RAM
- 340MB Hard Drive
- Built-in 16 bit Sound
- 2 Type II or 1 Type III PC Card slots
- NiMH Battery
- 3 Year Manufacturer's Warranty

486 DX4/75
\$3,429

IBT75CT8/3

ThinkPad 360 486DX2/50MHz	
340MB, 4MB, Active Matrix Color	\$2,036
540MB, 4MB, Dual Scan Color	2,860
540MB, 4MB, Active Matrix Color	3,290
ThinkPad 755 486DX4/100MHz	
540MB, 8MB, Dual Scan Color	\$4,940
810MB, 8MB, Dual Scan Color	5,390
540MB, 8MB, Active Matrix Color	5,940

TEXAS INSTRUMENTS

TravelMate 5000

- 75MHz Pentium® Processor
- 10.4" Active Matrix Color Display
- 8MB RAM exp. to 40MB
- 772MB Hard Drive
- 2MB Video RAM
- PCI Local Bus
- 2 Type II or 1 Type III PC Card slots
- 2 Lithium Ion Batteries
- 3 Year Mfr's Warranty



TEXTMPC7

\$4,519

TEXAS INSTRUMENTS

4000M Series Multimedia	
340MB, 4MB, DX4/75, 9.5" Active Matrix Color	\$2,175
455MB, 4MB, DX4/75, 9.5" Dual Scan Color	2,175
455MB, 4MB, DX4/75, 9.5" Active Matrix Color	2,290
524MB, 4MB, DX4/100, 9.5" Active Matrix Color	3,179

AST

Accentia 950N Pentium® 75MHz	
500MB, 8MB, 10.4" Dual Scan Color	\$3,290
800MB, 8MB, 10.4" Dual Scan Color	3,549
1.2GB, 8MB, 10.4" Dual Scan Color	4,015
800MB, 8MB, 10.4" Active Color	4,669
1.2GB, 8MB, 10.4" Active Color	5,139
Accentia 910N DX4/75MHz	
720MB, 8MB, 10.4" Active Color	\$3,879
510MB, 8MB, 10.3" Dual Scan Color	2,580
Accentia 910N DX2/50MHz	
340MB, 8MB, 10.3" Dual Scan Color	\$2,399

SYSTEMS
AST COMPUTER


AST Bravo Series feature:

- 486DX2/66 through 100MHz Pentium® Processors available
- 540MB or 1GB IDE Hard Drive
- 8MB or 16MB RAM (128MB Max)
- Accelerated 64 bit PCI Local Bus graphics
- Three case styles available
- Desktop
- Low-Profile Desktop
- Mid-Tower
- EPA Energy Star, VESA & DPMS compliant
- 3 Year Manufacturer's Warranty

Bravo MS-T Pentium® 75MHz
540MB IDE HD, 8MB RAM
50703-301

\$1,739

AST COMPUTER

AST Bravo MS Models

Processor	RAMMD	Case Style	Prod. Code	Price
486DX2/66	8/540MB	Desktop	501442-401	\$1,429
486DX4/100	8/540MB	Desktop	501443-401	1,560
75MHz Pentium®	8/540MB	Desktop	501701-401	1,739
75MHz Pentium®	16/1GB	Desktop	501701-501	2,330
90MHz Pentium®	8/540MB	Desktop	501534-401	2,000
90MHz Pentium®	16/1GB	Desktop	501534-501	2,600
100MHz Pentium®	8/540MB	Desktop	501754-301	2,179
100MHz Pentium®	16/1GB	Desktop	501754-401	2,779

AST COMPUTER

AST Premier GX Models

Processor	RAMMD	Case Style	Prod. Code	Price
Pentium® 90MHz	8/540MB	Desktop	501700-301	\$2,819
Pentium® 90MHz	16/1GB w/CD ROM	Desktop	501700-401	3,815
Pentium® 100MHz	16/1GB	Desktop	501522-201	3,555

In Touch with Tomorrow
TOSHIBA

T2150CDS Satellite Pro™

- 486DX4/75MHz Processor
- 10.4" Dual Scan Color Display
- 8MB RAM
- 500MB Hard Drive
- Internal Toshiba ZX 5.25" CD-ROM
- 16 bit Sound Blaster Pro™ compatible
- 2 Type II or 1 Type III PC Card slots
- Integrated power supply (No AC Adapter)
- Accupoint™ integrated pointing device
- External 1.44MB, 3.5" floppy drive
- 3 Year Mfr's Warranty



MAT2150CDS

\$3,099

In Touch with Tomorrow
TOSHIBA

T2100 486DX2/50MHz - Built-In Power Supply	
280MB, 4MB, 9.5" Monochrome	\$1,415
330MB, 4MB, 10.4" Dual Scan Color	2,019
330MB, 8MB, 8.4" Active Matrix Color	2,690
T2490 486DX4/75MHz	
320MB, 8MB, 9.5" Active Matrix Color	\$3,155
800MB, 8MB, 9.5" Active Matrix Color	3,230
T4890 486DX4/75MHz Multimedia	
500MB, 8MB, 10.4" Active Matrix Color	\$3,325
772MB, 8MB, 10.4" Active Matrix Color	3,490
T4900 Pentium® 75MHz	
772MB, 8MB, 10.4" Active Matrix Color	\$4,850

IBM

ThinkPad 701CS 486DX4/75MHz	
390MB, 8MB, 10.4" Dual Scan Color	\$3,290
540MB, 8MB, 10.4" Dual Scan Color	4,015
ThinkPad 701C 486DX4/75MHz	
360MB, 8MB, 10.4" Active Color	\$3,549
540MB, 8MB, 10.4" Active Color	4,669

AST COMPUTER

Accentia 910N

- 486DX4/75MHz
- 10.4" Active Matrix Color Display
- 8MB RAM
- 510MB Hard Drive
- 3 Year Mfr's Warranty



901899-301

\$3,599

PC CARDS

Megahertz

XLJACK 14.4/14.4 Fax/Modem	\$175
Cellular 14.4/14.4 Fax/Modem	180
XLJACK 28.8/14.4 PC Card Fax/Modem	359

Robotics

Speaker 14.4/14.4 PC Card Fax/Modem	\$180
Speaker 28.8/14.4 PC Card Fax/Modem	359
Counter 14.4/14.4 PC Card Fax/Modem	340
Counter 28.8/14.4 PC Card Fax/Modem	390

Xircom

Network Combo	\$185
Network RJ-45	179
Network BNC	179

Order today - Get it tomorrow!

Insight

FedEx
800-998-8014



Order
24 hours
a day!

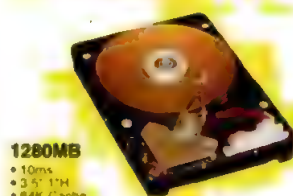
computers, hardware & software.

HARD DRIVES

WESTERN DIGITAL

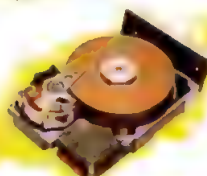
Seagate

FUJITSU



1280MB
• 10ms
• 3.5" 1H
• 64K Cache
• Enhanced IDE

\$349



2100MB
• 9ms
• 3.5" 1H
• 512K Cache
• Fast SCSI-2

\$835

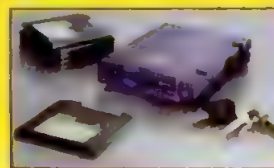


1080MB
• 10ms
• 3.5" 1H
• 256K Cache
• Fast-ATA-2

\$299

REMOVABLE STORAGE

1 iomega
Affordable personal storage to backup, organize, and move data—as fast as your hard drive!



Zip—3 Drives in 1

- Expand your hard drive without limits—25MB and 100MB Cartridges
- Portable—fits in your hand and weighs 1 pound
- Backup your hard drive—fast and easy, 20ms access time, up to 1MB/sec transfer rate

SCSI for PC or Mac

\$199.95

IOZIPSCSI

Parallel Port Model

\$199.95

IOZIPPAR

ZIP Cartridges

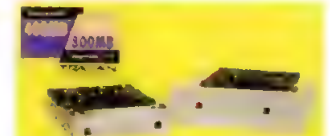
- Single Cartridge IOZIPPTPC \$19.95
- Three-Pack Cartridges IOZIPPTPS 49.00
- Ten-Pack Cartridges IOZIPPTPC 149.95

FUJITSU



- Internal MO 230MB (PC) w/2 Cartridges \$679
- DynaMO 230MB (Mac) w/1 Cartridge 679
- DynaMO 230MB (PC) w/1 Cartridge 729

TAPE BACKUPS



HP Colorado T1000

The world leader in tape backup! 800MB Travan Tape Drive—A new standard in data protection delivering reliable high capacity mini cartridges storage while maintaining full QIC-80 (read and write) and QIC-40 (read) compatibility with millions of existing tape drives.

\$199

COHPT1000

MEGA

- Insider 250MB Internal Tape Backup \$99
- Dino 420MB Internal Tape Backup 189
- Dino 850MB Internal Tape Backup 219

COLORADO

- 350MB Internal Tape Backup \$149
- Trakker 250MB External Parallel 279
- Trakker 700MB External Parallel 399
- Travan 800MB Internal Tape Backup 199

CONNER

- TapeSitor 420MB Internal Tape Backup \$169
- TapeSitor 850MB Internal Tape Backup 269

EXABYTE

- Model 8505 140B 8mm Internal \$2.199
- Model 8205 7GB 8mm Internal 1.299
- Model 8505E 140B 8mm External 2.299

WESTERN DIGITAL

Seagate

CONNER

Maxtor

Quantum

FUJITSU

TOSHIBA

Seagate

MICROPOLIS

FUJITSU

CONNER

Quantum

Capacity**	Access	Form Fctr/Ht.	Interface	Cache	RPM	Product Code	Bare Kit	16 Bit Kit
540MB	11ms	3.5" 1H	Enhanced IDE	64	4,900	WD2540A	\$199	\$239*
635MB	11ms	3.5" 1H	Enhanced IDE	64	4,900	WD2635A	219	259*
850MB	10ms	3.5" 1H	Enhanced IDE	64	4,500	WD2850A	239	279*
1080MB	10ms	3.5" 1H	Enhanced IDE	64	4,500	WD31000A	319	359*
1280MB***	10ms	3.5" 1H	Enhanced IDE	64	4,500	WD31200A	349	389*
1620MB***	9ms	3.5" 1H	Enhanced IDE	64	5,200	WD31600A	599	639*
428MB	14ms	3.5" 1H	Fast ATA	120	3,811	ST3491A	\$185	\$185
545MB	14ms	3.5" 1H	Fast ATA	120	3,811	ST360A	179	219*
722MB	12ms	3.5" 1H	Fast ATA-2	256	4,900	ST3780A	229	289*
854MB	12ms	3.5" 75H	Fast ATA-2	256	5,400	ST3850A	239	279*
1063MB***	12ms	3.5" 1H	Fast ATA-2	256	4,900	ST31220A	309	349*
1270MB	12ms	3.5" 1H	Fast ATA-2	256	4,500	ST31270A	309	349*
262MB	16ms	2.5" 12.7MM	2.5" Fast ATA	120	3,980	ST3300AG	219	N/A
341MB	16ms	2.5" 19MM	2.5" Fast ATA	120	3,980	ST3385AG	275	N/A
524MB	16ms	2.5" 19MM	2.5" Fast ATA	120	3,980	ST3655AG	389	N/A

Seagate and the Seagate logo are registered trademarks of Seagate Technology, Inc.

425MB	14ms	3.5" 1H	Enhanced IDE	32	3,600	CFS425A	\$189	\$189
541MB	14ms	3.5" 1H	Enhanced IDE	32	3,600	CFS540A	185	235*
850MB	14ms	3.5" 1H	Enhanced IDE	32	3,600	CFS850A	239	279*
1275MB	12ms	3.5" 1H	Enhanced IDE	32	3,600	CFA1275A	359	399*

420MB	12ms	3.5" 1H	Enhanced IDE	32	3,551	MX7420AV	\$175	\$195
540MB	12ms	3.5" 1H	Enhanced IDE	32	3,600	MX7540AV	185	225*
850MB	12ms	3.5" 1H	Enhanced IDE	64	3,600	MX7850AV	235	275*
1280MB	12ms	3.5" 1H	Enhanced IDE	256	4,500	MX71280AV	335	375*

420MB	14ms	3.5" 1H	Fast ATA-2	128	4,500	QUTR420A	\$185	\$185
544MB	12ms	3.5" 1H	Fast ATA-2	128	5,400	QUFB540A	199	239*
850MB	14ms	3.5" 1H	Fast ATA-2	128	4,500	QUTR850A	245	285*
1080MB	12ms	3.5" 1H	Fast ATA-2	128	5,400	QUFB1080A	299	339*

528MB	12ms	3.5" 1H	ATA-2	256	4,500	FJ2884A	\$175	\$195
1080MB	10ms	3.5" 1H	Fast ATA-2	256	5,400	FJ1606A	299	339

540MB	13ms	2.5" 12.7MM	2.5" IDE	128	4,200	MK1824FCV	\$399	N/A
810MB	13ms	2.5" 19MM	2.5" IDE	128	4,200	MK2628FC	499	N/A

*Bundled with QSI Model 18 IDE Accelerator. **Capacities based upon manufacturer's quoted capacity where 1MB = 1,048,576 bytes. ***Experts Choice Drives.

Capacity**	Access	Form/Hgt.	Interface	Cache	RPM	Prod. Code	Bare Kit	16 Bit Kit
1052MB	9ms	3.5" 1H	Fast SCSI-2 A/V	256	5,400	ST31230N	\$495	\$595
2100MB	9ms	3.5" 1H	Fast SCSI-2 A/V	256	5,400	ST32430N	835	935
4294MB	9ms	3.5" HH	Fast SCSI-2 A/V	512	5,411	ST15230N	1,079	1,179
9080MB	11ms	5.25" FH	Fast SCSI-2 A/V	1,024	5,400	ST410800N	2,585	2,685
High Performance Barracuda Drives								
2145MB	8ms	3.5" 1H	Fast SCSI-2 A/V	512	7,200	ST32550N	\$949	\$1,049
4294MB	8ms	3.5" HH	Fast SCSI-2 A/V	1,024	7,200	ST15150N	1,349	1,449
88 Pin Wide SCSI Drives								
1314MB	8ms	3.5" HH	Wide SCSI A/V DHP	1,024	7,200	ST12450W	\$1,425	N/A
2139MB*	8ms	3.5" HH	Wide SCSI A/V	512	7,200	ST32550W	1,005	N/A
4294MB*	8ms	3.5" HH	Wide SCSI A/V	1,024	7,200	ST15150W	1,409	N/A

Seagate and the Seagate logo are registered trademarks. Barracuda and its logo are trademarks of Seagate Technology, Inc.

2100MB	8.5ms	3.5" 1H	Fast SCSI-2	512	7,200	MC4221S	\$989	\$989
4300MB	8.5ms	3.5" HH	Fast SCSI-2	512	7,200	MC3243S	1,149	1,249
9100MB	12ms	5.25" FH	Fast SCSI-2	512	5,400	MC1991	2,125	2,225

9100MB Visual Drives								
2100MB	8.5ms	3.5" 1H	Fast SCSI A/V	512	7,200	MC4221AV	\$989	\$1,089
4300MB	8.5ms	3.5" HH	Fast SCSI A/V	512	7,200	MC3243AV	1,249	1,349
9100MB*	12ms	5.25" FH	Fast SCSI A/V	512	5,400	MC1991AV	2,235	2,335

530MB	12ms	3.5" 1H	Fast SCSI-2	256	4,500	FJ2884S	\$189	\$289
1080MB*	10ms	3.5" 1H	Fast SCSI-2 A/V	256	5,400	FJ1606S	429	529
2100MB*	8.5ms	3.5" HH	Fast SCSI-2 A/V	512	7,200	FJ2915S	879	979
4200MB	8.5ms	3.5" HH	Fast SCSI-2 A/V	512	7,200	FJ2934S	1,149	1,249

58 Pin Wide SCSI Drives								
2100MB	8.5ms	3.5" HH	Wide SCSI-2 A/V	512	7,200	FJ2915W	\$939	\$1,039
4200MB	8.5ms	3.5" HH	Wide SCSI-2 A/V	512	7,200	FJ2934W	1,219	1,319

1080MB	11ms	3.5" 1H	Fast SCSI-2	256	5,400	CFP1080S	\$469	\$569
2147MB	8.5ms	3.5" 1H	Fast SCSI-2	512	5,400	CFP2105S	679	779
2147MB	8.5ms	3.5" 1H	Fast SCSI-2	512	7,200	CFP2107S	999	1,099
4294MB	9ms	3.5" HH	Fast SCSI-2	512	7,200	CFP4207S	1,339	1,439

420MB	14ms	3.5" 1H	Fast SCSI-2	128	4,500	QUTR420S	\$195	\$295
540MB	12ms	3.5" 1H	Fast SCSI-2	128	5,400	QUFB540S	225	325
850MB	14ms	3.5" 1H	Fast SCSI-2	128	4,500	QUTR850S	275	375
1080MB	12ms	3.5" 1H	Fast SCSI-2	128	5,400	QUFB1080S	445	545
2126MB	8.5ms	3.5" 1H	Fast SCSI-2	512	5,400	QUVP221S	789	889
2150MB	8ms	3.5" 1H	Fast SCSI-2	1,024	7,200	QUXP3125S	999	999
4280MB	8.5ms	3.5" HH	Fast SCSI-2	512	7,200	QUQP4280S	1,199	1,299

* Experts Choice Drives. ** Capacities based upon manufacturer's quoted capacity where 1MB = 1,048,576 bytes.

FREE Insight Catalog.
Thousands of products at great prices.

America's discount source for computers, hardware and software

- BETTER**
 - Order 24 hours a day, seven days a week.
 - Where? Free! Money-back guarantee!
 - Conner's name: day in, day out for hard drives—straight from the factory—straight from the factory!
 - If you don't like it, we'll take it back!
 - If you don't like it, we'll take it back!
 - If you don't like it, we'll take it back!
- FASTER**
 - Same day delivery available.
 - Fully automated Federal Express delivery.
 - 24 hour delivery on all prebuilt systems.
 - Monitor stock items delivered the next business day.
 - Call our Fax or Demand Service at 800-998-8014.
 - Results to our Internet-based information system response on-line.
 - Call 800-998-8014.
- CHEAPER**
 - If you find a better price, call us before you buy.
 - Our tremendous buying power means savings to you.
 - Unlimited post-purchase options including price matching.
 - Call for participation in our NEW! Top Secret Shopper's Paradise—FREE!

FedEx
Federal Express

800-998-8014

CIRCLE 219 ON READER SERVICE CARD

Insight



America's discount source for

PRINTERS

Canon



Canon Bubble Jet BJC-70 Color Printer

- 348 characters per second
- 30 sheet/5 envelope sheet feeder
- 720 dpi
- 20 TrueType scalable fonts
- EPA Energy Star compliant

\$359

CNBJC70

Bubble Jet	CPS	MEM	DPI	Prod. Code	Price
BJ-100	140	50K	360	CNBJ100	\$209
BJ-200EX	240	62K	720	CNBJ200EX	\$335
BJ-30 Portable	348	38K	720	CNBJ30	\$259
BJC-70 Cdt Port	348	38K	720	CNBJC70	\$359
BJC-4000	498	64K	720	CNBJC4000	\$359
BJ-230	248	41K	360	CNBJ230	\$309
BJC-600E	240	60K	720	CNBJC600E	\$409

Laser	PPM	RAM	DPI	Prod. Code	Price
LBP-430W	4	1MB	300	CNLP430W	\$449
LBP-1260	12	2MB	600	CNLP1260	\$1,269

OKIDATA

ML380 Dot Matrix, 24-pin, 240 CPS, narrow	\$215
ML500 Dot Matrix, 24-pin, 450 CPS, narrow	\$425
OL400E LED, 300 dpi, 4ppm, 512K	\$369
OL410E LED, 600 dpi class, 4ppm, 2MB	\$339
OL410E/PS LED, 600 dpi class, 4ppm, 2MB	\$759
OL810 LED, 300 dpi, 8ppm, 2MB	\$909
OL850 LED, 300 dpi, 8ppm, 2MB	\$1,239

*With \$50 life's Mail-In Rebate (ends 9-30-99)

PRINTERS



**HEWLETT®
PACKARD**

Hewlett-Packard DeskJet 660C

- 3 pages per minute
- 128MB memory and 128MB fonts
- 128K memory
- 3 Year Manufacturer's Warranty

HPDJ660C

\$479



NEW!

Hewlett-Packard LaserJet 5P

- 6 pages per minute
- 54 memory and 128MB fonts
- 2MB memory, maximum 128MB
- IRGA compliant infrared port, various cable free
- 1 Year Manufacturer's Warranty
- HP Remanufactured Technology and
- Multiple Task, Low Cost, High Output available!
- Intelligent On/Off automatic power
- 1 Year Manufacturer's Warranty

HPLJ5P

\$859

DeskJet	PPM	Memory	Fonts	DPI	Prod. Code	Price
HP DeskJet 320 Port	3	48K	20	600x300	HPDJ320	\$289
HP DeskJet 540	3	512K	22	600x300	HPDJ540	\$299
HP DeskJet 660C	3	64K	20	600x300	HPDJ660C	\$479
HP DeskJet 1200C	7	2MB	46	600x300	HPDJ1200C	\$979
HP DeskJet 1200C/PS	7	4MB	81	600x300	HPDJ1200P	\$1,579

LaserJet	PPM	Memory	Fonts	DPI	Prod. Code	Price
HP LaserJet 4L	4	1MB	26	300	HPLJ4L	\$509
HP LaserJet 5P	6	2MB	54	600	HPLJ5P	\$859
HP LaserJet 5MP	6	3MB	35PS	600	HPLJ5MP	\$999
HP LaserJet 4ML	4	4MB	35PS	300	HPLJ4ML	\$1,019

PRINTERS

EPSON®



Epson Stylus 720dpi Color Inkjet

- Extra sharp printing
- True 720 dpi resolution
- Latest color technology
- Windows compatible
- Paper handling convenience
- Specifically designed printer software
- 2 Year Limited Warranty
- Toll free Epson-connection

\$509

EPSTCLR

Laser	PPM	DPI	Prod. Code	Price
Action Laser 1100	4	300	EPSC146001	\$389
Action Laser 1400	4	600	EPSC148001	\$399

Ink Jet	CPS	DPI	Prod. Code	Price
Stylus 1000	225	360	EPST1000	\$479
Stylus Color	5.5	720	EPSTCLR	\$509

Dot Matrix	CPS	PPM	Prod. Code	Price
LQ-300	240	24	EPSLQ300	\$185
LQ570+	288	24	EPSLQ570+	\$289
LQ-1070+	337	24	EPSL1070+	\$409
DFX8000	950	9	EPSPFX#	\$2,575

**TEXAS
INSTRUMENTS**

MicroLaser 600, 600 dpi, 5ppm, 2MB, PS23	\$849
MicroLaser Pro E, 800 dpi, 12ppm, 3MB	\$1,349
MicroLaser Pro 600, 600 dpi, PS23	\$1,179
MicroLaser Power Pro, 600 dpi, 12ppm, 6MB	\$1,589

MONITORS



17" DX17F

- 26mm
- 1280x1024
- Non-Interlaced
- MPRII Certified
- Energy Star Compliant

CMDX17

\$639



15" 28" 1280x1024 INT CMVSON15F	\$339
15" 28" 1280x1024 N I CMVSON15F	\$409
17" 28" 1280x1024 N I CMDX17	\$639
21" 28" 1600x1200 N I CMVX21F	\$1,759

ViewSonic
See The Difference!

15" 28" 1024x768 INT CMVSON15E	\$359
15" 28" 1280x1024 N I CMVSON15G	\$439
17" 28" 1280x1024 N I CMVSON17G	\$499
17" 28" 1600x1200 N I CMVSON17G	\$899
21" 28" 1600x1200 N I CMVSON21G	\$1,529
21" 28" 1600x1200 N I CMVSON21G	\$1,799

MAGNAVOX
Smart. Very smart.



17" 20CM64

- 31mm
- 1280x1024
- Non-Interlaced
- MPRII Certified
- Energy Star Compliant

CMMA20CM64M

\$1,099

MAGNAVOX
Smart. Very smart.

14" paper white 640x480 N I CMMA14M74	\$109
14" 28mm 1024x768 N I CMMA14M99	\$239
14" 28mm 1024x768 N I CMMA2099	\$249
15" 28" 1024x768 INT CMMA2015	\$329
15" 28" 1280x1024 N I CMMA2015	\$379
17" 31" 1024x768 N I CMMA2017	\$669
20" 31" 1280x1024 N I CMMA20CM64	\$1,099



17" 1765GM

- 28mm
- 1280x1024
- Non-Interlaced
- MPRII Certified
- Energy Star Compliant

CM1765GM

\$699

14" 28" 1024x768 N I CMCT1461C	\$239
15" 28" 1024x768 N I CM1565GD	\$349
17" 28" 1280x1024 N I CM1765GM	\$639
17" 28" 1280x1024 N I CMCT1765GM	\$699

PRINCETON®
GRAPHIC SYSTEMS

14" 39" 800x600 INT CMPGU14	\$199
14" 28" 1024x768 N I CMPGU14H	\$239
15" 28" 1280x1024 N I CMPGU15	\$349
17" 28" 1280x1024 N I CMPGU17	\$629

VIDEO CARDS



Gal Video Card 32 bit VLB/PCI, 1MB DRAM exp. to 2MB	\$99
Bahamas Video Card 64 bit VLB/PCI, 2MB DRAM exp. to 4MB	\$199
Barbados Video Card 64 bit PCI, 2MB DRAM exp. to 4MB	\$299



Graphics Expression, 64 bit, ISA/VLB/PCI, 2MB DRAM	\$209
Graphics Pro Turbo, 64 bit, ISA/VLB/PCI, 2MB VRAM-4MB Max	\$379
Graphics Pro Turbo, 64 bit, ISA/VLB/PCI, 4MB VRAM	\$589



Stealth Video 64 bit, VLB 1MB DRAM	\$169
Stealth Video 64 bit, PCI 1MB DRAM	\$169
Stealth Video 64 bit, VLB 2MB DRAM	\$259
Stealth Video 64 bit, PCI 2MB DRAM	\$259
Stealth 64 Video, 64 bit, VLB 2MB VRAM	\$329
Stealth 64 Video, 64 bit, PCI 2MB VRAM	\$329
Stealth 64 Video, 64 bit, VLB 1MB VRAM	\$499
Stealth 64 Video, 64 bit, PCI 4MB VRAM	\$499



- If you don't see what you need or if you find a lower price - call us!
- Most in-stock items delivered the next business day. Ask about same day delivery!
- We love businesses! Quick P.O. confirmation and credit approvals. Ask about volume pricing.



800-998-8014



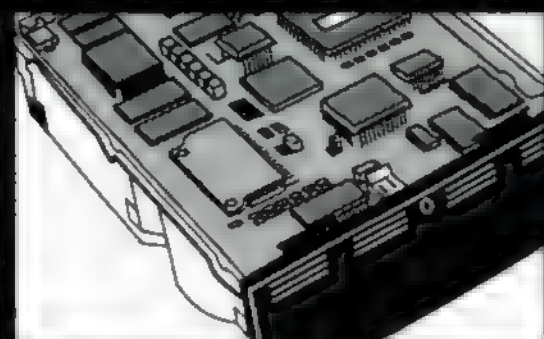
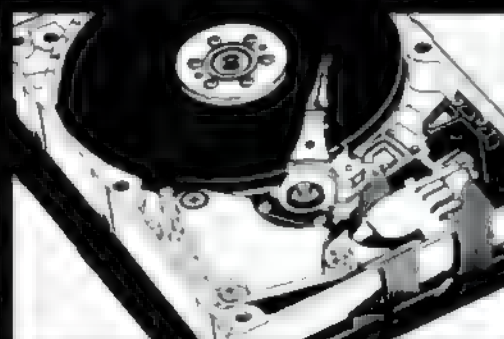
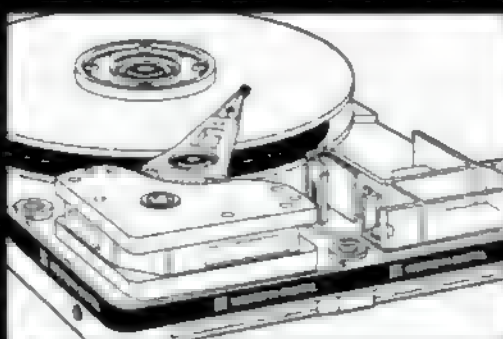
Call
about same day
delivery!

CIRCLE 167 ON READER SERVICE CARD

MEGAHAUS

HARD DRIVES

The Drive Authority!



UNEQUALED REPUTATION

Nobody knows drives like MegaHaus. We have specialized in storage solutions for over 8 years. Repeat business from satisfied customers is the backbone of our business. We satisfy our customers.

DIRECT REPLACEMENT WARRANTY

During the first year of your warranty, we replace, not repair, any defective items. All items receive lifetime technical support from our factory trained techs.

SAME DAY SHIPPING

Our multi-million dollar inventory offers you the best diversity and availability in the market. We ship most orders the same day. Each order is checked at least four times for accuracy.

FAST, EASY INSTALLATION

Anyone can sell a hard drive to you. We sell easy to install storage solutions. We spend countless hours researching the best solutions, then create our quick precise installation guides for each kit.

UNBEATABLE DEALS

Maxtor

FREE Max Blast auto install software (with 540MB and larger)
2 Yr "No Quibble Service Policy" offers advance replacement.

427MB	\$170	1.0GB	\$307
540MB	\$185	1.2GB	\$329
854MB	\$225	1.6GB	\$435

NEC

540MB	12ms	4500rpm	IDE	2yr wty.	\$170
730MB	11ms	4090rpm	IDE	2yr wty.	\$190
1083MB	11ms	4090rpm	IDE	3yr wty.	\$305
1083MB	11ms	4090rpm	SCSI	3yr wty.	\$360

FUJITSU

Fujitsu drives offer Japanese quality and dependability at a very affordable price.

530MB	IDE	2yr	4500rpm	M2684T	\$180
530MB	SCSI	2yr	4500rpm	M2684S	\$196
1080MB	IDE	3yr	5400rpm	M1606T	\$285
1080MB	SCSI	3yr	5400rpm	M1606S	\$375
2100MB	SCSI	5yr	7200rpm	M2915S	\$870

SyQuest

540MB of removable storage only \$399!
Buy a 270MB IDE drive with 1 cartridge for \$389 and get a 2nd cartridge for only \$10*. Each 270MB disk also comes with free Fast Back Express software. The 270MB IDE drive is 3 1/2" x 1" high, 13.5ms, 128K buffer.
(*\$10 cartridge is a limited promotion. Begins April 12, 1995. Limited to the first 200 orders.)

OPTICAL DRIVE SALE!

Price includes 1 FREE disk! Complete internal and external kits available for all computers.

Capacity	Brand	Speed	Buffer	Wty	Price
230MB	Fujitsu	30ms	256K	1yr	\$529
1.3Gig	NEC	25ms	1MB	2yr	\$1679
1.3Gig	Maxoptix	23ms	4MB	1yr	\$2149

NEW TAPE DRIVES

Save \$10 on tape drive with hard drive purchase!
All prices include 1 FREE TAPE, cable, software.

CONNER	Int	Ext	COLORADO	Int	Ext
420MB	\$165	\$317	350MB	\$179	\$319
850MB	\$215	\$360	800MB	\$239	\$Call
1.7Gig	\$339	\$Call	1360MB	\$349	\$Call

HARD DRIVES

CONNER

IDE			
540MB	15ms	CFS540A	\$175
850MB	14ms	CFS850A	\$215
1278MB	14ms	CFS1275A	\$309
SCSI			
1080MB	11ms	CFP1080S	\$469
2147MB	8.5ms	CFP2105S	\$869
2147MB	8.5ms	CFP2107S	\$985

MICROPOLIS

SCSI			
2050MB	8.5ms	MC4221	\$870
4294MB	8ms	MC3243	\$1300
9100MB	12ms	MC1991	\$2120
WIDE SCSI			
2050MB	8.5ms	MC4221W	\$1079
4294MB	8ms	MC3243W	\$1499
9100MB	12ms	MC1991W	\$2399
SCSI-AV Audio / Visual tuned drives			
2000MB	8.5ms	MC4221AV	\$949
4294MB	8ms	MC3243AV	\$1420
9100MB	12ms	MC1991AV	\$2239

IDE			
420MB	14ms	ST3491A	\$160
545MB	14ms	ST3660A	\$175
722MB	12ms	ST3780A	\$230
850MB	11ms	ST5850A	\$230
1083MB	12ms	ST31220A	\$305
SCSI (WIDE SCSI also available)			
1052MB	9ms	ST31230N	\$519
2147MB	9ms	ST32430N	\$885
2147MB	8ms	ST32550N	\$979
4290MB	9ms	ST15230N	\$1130
4290MB	8ms	ST15150N	\$1489
9080MB	11ms	ST410800N	\$2499

WESTERN DIGITAL

IDE			
540MB	11ms	AC2540	\$209
850MB	10ms	AC2850	\$232
1083MB	10ms	AC31000	\$326
1280MB	10ms	AC31200	\$344

HARD DRIVES

Quantum

IDE			
420MB	12ms	TB420A	\$160
541MB	11ms	LT540A	\$189
545MB	12ms	FB540A	\$195
731MB	11ms	LT730A	\$229
850MB	12ms	TB850A	\$239
1050MB	12ms	FB1080A	\$319
SCSI			
541MB	11ms	LT540S	\$200
545MB	12ms	FB540S	\$205
731MB	11ms	LT730S	\$229
850MB	14ms	TB850S	\$269
1050MB	12ms	FB1080S	\$405
2150MB	8ms	XP32150	\$880
2216MB	8.5ms	VP32210	\$909
4300MB	8.6ms	XP34301	\$1499
4300MB	8ms	XP34300	\$1499

SYQUEST

The #1 name in removable media drives!
SCSI 88MB 200MB 270MB
Bare Drive \$249 \$350 \$349
Drive with 1 disk \$298 \$422 \$408
External \$309 \$410 \$409
Internal Kit \$369 \$499 \$469
Performance Kit \$469 \$599 \$569
External Kit for Mac \$369 \$499 \$469
IDE Drive PC Kit Portable
270MB SQ3270A \$330 \$429 \$529
Genuine Syquest Cartridges
Qty 2-4 / 5-9 / 10+ or with drive 44MB \$53/\$51/\$50
88MB \$55/\$51/\$49 105MB \$56/\$54/\$53
200MB \$80/\$75/\$72 270MB \$65/\$62/\$59

NOTEBOOK UPGRADES

2.5" Drives		SCSI	IDE
240MB	14ms	Fujitsu	\$269
514MB	17ms	Quantum	\$409
540MB	12ms	Fujitsu	\$409
			N/A

Fastest notebook drive! 5400 rpm!
We stock Microsolutions Backpack drives.

CD ROM DRIVES

SCSI				
Plextor	6PLEX	6X	145ms	\$520
NEC	CDR6X	6X	150ms	\$499
Toshiba	XM3601	4.4X	155ms	\$299
NEC	CDR4X	4X	220ms	\$319
Plextor	PX43CS	4X	170ms	\$339
Sanyo	SH254S	4X	190ms	\$209
Sanyo	SH93R	2X	280ms	\$149
Chinon	CDSS25S	2X	280ms	\$125

IDE (ATAPI)				
Mitsumi	CRMCFX400	4X	230ms	\$185
Toshiba	XM5302A	4X	190ms	\$219
PIONEER SCSI CD ROM CHANGERS				
DRM602X	6Disc	2X	300ms	\$399
DRM624X	6Disc	4X	190ms	\$699
DRM1804X	18Disc	4X	300ms	\$1899

We offer complete multi-media kits with any of our CD ROM Drives.

CD ROM TOWERS

Multiple drives in a single enclosure.
Chinon 2X Sanyo 4X NEC or Tosh 4X Plextor 6X
4 Drive \$889 \$1219 \$1629 \$2699
7 Drive \$1499 \$2099 \$2799 \$4689
Call for other models.

TAPE DRIVES

-SCSI Kit includes 16bit card, DOS or Windows software & 1 tape.			
250MB	Conner	2150	\$339
525MB	Conner	2525	\$479
2Gig	HP	35470	\$749
2Gig	Conner	CTD2000	\$849
2-4Gig	Conner	TSM4000	\$539
2-4Gig	Conner	CTD4000	\$869
2-4Gig	HP	35480	\$869
4-8Gig	Conner	CTD8000	\$969
4-8Gig	HP	C1533A	\$1049

We offer backup software for most computers and operating systems. TAPEDISK use our SCSI tapes as a regular disk drive NOW ONLY \$199

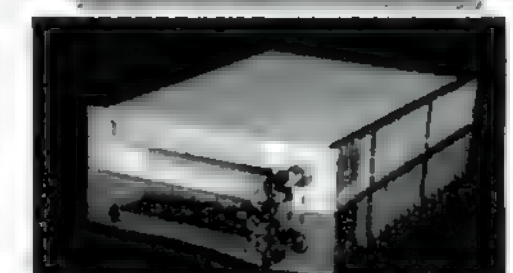
MISCELLANEOUS

Drive Media! WIDE SCSI, Optical, Macintosh & Power PC Drives, Hard Disk Cards, PCMCIA, 2 1/2" Drives, Floppy Drives, IBM PS/1, PS/2, and Tandy Drives.

CONTROLLER CARDS

IDE				
GSI 16Bit IDE accelerators (enhanced IDE)				
Boost Performance 30 to 80%! VESA coming soon.				
1533-18 2 IDE			\$55	\$40
1533-21 2IDE, 4 Floppy			\$65	\$55
1533-32 2IDE, 4 Floppy, 10			\$125	\$115
TEKRAM				
DC280E, 4 drive Enhanced VESA, 2 16550 serial ports,				
1 EPP parallel port, 1 game port			\$65	\$55
DC200S 16Bit IDE w/ High Speed 10			\$55	\$45
DC290N Bus Master PCI			\$59	\$49
DC600CF 16Bit Caching			\$89	\$79
DC680C 32Bit Local Bus Cache			\$109	\$99
DC690C 32Bit PCI Cache			\$149	\$139
SCSI				
ADAPTEC				
A1522BASIC 16Bit			\$129	\$109
A1542COREL 16Bit			\$235	\$225
A2742 EISA			\$379	\$369
A2842 VESA			\$259	\$249
A2940Kit PCI			\$289	\$269
Tekram (includes COREL SCSI)				
DC300B 16Bit			\$159	\$149
DC800B 16Bit Caching			\$199	\$189
DC380B 32Bit VESA			\$179	\$169
DC880B 32Bit VESA Cache			\$299	\$289
Future Domain 1680 16Bit			\$134	\$119
QLOGIC PCI SCSI & WIDE			\$325	\$315

DRIVE HARDWARE



NEW! High Quality pull out brackets for 3.5" hard drives. Mounts in 5 1/4" bay. Entire frame is metal, gold connectors rated at 50K insertions, built in cooling fan. SCSI unit has ID select on cartridge. Great for security, RAID, or Backup. Hot swappable! SCSI 1 \$85 2-9 \$82 10+ or w/ drive \$79 IDE 1 \$79 2-9 \$76 10+ or w/ drive \$73

WE SELL HIGH QUALITY DISK ARRAYS AT AFFORDABLE PRICES!

Visit us on the internet
<http://phoenix.net-megahaus>

1-800-786-1182

August 1995 PC Magazine Sales Hours (Central Standard Time)

8am - 8pm Monday thru Friday 9am - 3pm Saturday

FAX (713) 534-6580 Local (713) 534-3919

T.T.Y. (Deaf) 800-473-0972 Corporate / Government 800-786-1146

We sell within the United States, its territories, and Canada (sorry no international orders)

MEGAHAUS
HARD DRIVES
2201 Pine Drive
Dickinson, Texas 77539



NO SURCHARGE

We accept Fortune 500 & Government bids & PO's
We check for COD and Credit Card fraud!

Prices & specifications subject to change without notice. Shipping charges are non-refundable. Returns must be in new condition and in original packaging. Defective items may not be returned. No refund on software or special orders (items not listed in ad.) All refunds subject to 10% restocking fee. Some equipment may vary in appearance. All trademarks are registered trademarks of their respective companies. Personal checks held for clearance. We reserve the right to refuse any sale for any reason. ©1995 Megahaus Inc.

PC MARKETPLACE

I N D E X

Premier

The color showcase that puts the spotlight on leading-edge PC products and services.

491-506

Classified

Flexible-format display advertising: computer systems, components, software and more.

507-523

BusinessCard

A forum for innovative, hard-to-find and low cost PC hardware, software and services.

524-526

HARDWARE

PREMIER CLASSIFIED

Batteries.....	
Boards/Components/Chips.....	492 507
Communications.....	495
Computer Systems.....	496 509
Input/Data Acquisition/Barcode/POS.....	497 510
Mass Storage Devices.....	498
Multimedia.....	499
Music/Midi.....	499
Networking.....	500
Peripherals.....	500
Power Supplies.....	
Security.....	
Video.....	

SOFTWARE

PREMIER CLASSIFIED

Barcode.....	
Business Applications.....	501 515
—Single-Solution.....	
Business Utilities.....	503
CD-ROM Titles.....	
Cellular Phones.....	515
Communications.....	515

Data Entry.....	
Database.....	
Desktop Publishing.....	
Education.....	503 515
Entertainment/Games.....	
Financial/Accounting.....	504
Foreign Languages/Font/Translation.....	515
Graphics/Design/CAD.....	504 515
—Digital Output Service.....	
Health/Fitness/Nutrition.....	
Human Resource.....	
Mailing List Management.....	
Manufacturing/Inventory.....	
Mapping/Demographic.....	
Medical/Dental.....	
Multi-Media.....	
Music/Midi.....	
OS/2.....	
Personal.....	
Programming Tools/Languages.....	
Real Estate.....	
Religion.....	

Scientific/Engineering.....	506
Security.....	515
Shareware/Public Domain.....	
Statistical/Research.....	
Utilities.....	
Windows.....	506 517
Adult.....	520

SERVICES

PREMIER CLASSIFIED

Computer Insurance.....	
Data Conversion/Data Recovery.....	517
Desktop Publishing.....	
On-Line.....	518
Scanning Services.....	
Software Duplication.....	518
Training/Tutorial.....	

MISCELLANEOUS

PREMIER CLASSIFIED

Accessories.....	496
Books/Catalogs.....	
Business Opportunities.....	519
Career Opportunities.....	
Supplies.....	506 519



**PERSONAL
TRAINING
SYSTEMS**

Interactive Tutorials

QuickStart for Windows 95

Interactive Training

Learn Windows 95 the easy way...

FREE!

• Use the Start button to open documents and programs - it's incredibly intuitive!





Endorsed by Peter Norton

• Use the Task Bar to quickly switch between programs - it's that easy!



QuickStart for Windows 95

Try It Free!

- 2 out of 8 lessons (20 minutes) for New Users & 3.1 Upgraders
- Available on CD-ROM or Cassette/Disk (\$5.95 Shipping & Handling)

OR Get Complete PTS Training

- 3 levels: Basics, Beyond the Basics, Windows 95 for Windows 3.1 Upgraders
- CD-ROM (includes 3 levels) \$29.95 or Cassette/Disk \$29.95 each level (\$5.95 Shipping & Handling)

Microsoft
SOLUTION PROVIDER

800-832-2499, Intl: 415-462-2100, Internet: ptssales@ptst.com

Personal Training Systems, 173 Jefferson Drive, Menlo Park, CA 94025

Call or Email PTS today:

800-832-2499, Intl: 415-462-2100, Internet: ptssales@ptst.com

Personal Training Systems, 173 Jefferson Drive, Menlo Park, CA 94025

OVER
1030629
IN USE

This offer good only when purchased directly from Personal Training Systems. One copy per address. This offer good only in U.S.A. and Canada. Allow 4-6 weeks for delivery. Ground shipments only. Offer expires Sept. 31, 1995. All trademarks are the property of their respective owners. ©1995 Personal Training Systems, Inc. SOURCE CODE: AMWIN95



Your #1 Source For Computer Components & Systems!

KEYBOARDS Discovery Enhanced 101 Click Keyboard \$19 Focus 6000 101 Click \$25 Focus 2001 Keyboard w/Dustcover \$33 Focus 7000 w/Trackball Keyboard \$33 Focus 8000 w/Calculator \$49 Microsoft Natural Keyboard \$89 HARD DRIVES Western Digital AC2420MB 420MB 3.5" IDE 128K 3yr \$169 Western Digital AC2540 540MB IDE 128K 3yr \$195 Western Digital AC270MB 720MB 3.5" IDE 128K 3yr \$229 Western Digital AC2850 850MB 3.5" IDE 128K 3yr \$239 Western Digital AC3100 1.0GB 3.5" IDE 128K 3yr \$259 Western Digital AC31200 1.2GB IDE 3.5" 3yr \$335 IBM DP3531080 1.0GB FS/2 10ms 512K SCSI-II 3yr \$599 IBM DSA3540 545MB 3.5" IDE 12ms 96K 2yr \$199 CONNER CFA540A 540MB 3.5" IDE 12ms 256K 2yr \$160 CONNER CFA850A 850MB 3.5" IDE 12ms 256K 2yr \$180 CONNER CFA850A 850MB 3.5" IDE 12ms 256K 2yr \$229 CONNER CFP1060S 1.06GB SCSI-2 9.5ms 512K 2yr \$439 SAMSUNG 30560A 560MB 3.5" IDE 12ms 256K 2yr \$189 SAMSUNG 30420A 420MB 3.5" IDE 11ms 256K 2yr \$159 MAXTOR 7420AV 420MB 3.5" IDE 12ms 32K 2yr \$159 MAXTOR 7540AV 540MB 3.5" IDE 12ms 32K 2yr \$175 MAXTOR 7650AV 560MB 3.5" IDE 12ms 32K 2yr \$225 MAXTOR 71260A 1.2GB 3.5" IDE 12ms 256K 2yr \$329 QUANTUM EM1080S 1.0GB SCSI 3.10ms 512K 2yr \$489 QUANTUM EM2100S 2.1GB SCSI 3.95ms 512K 2yr \$650 QUANTUM MAVRICK 540MB F-SCSI 12ms 128K 2yr \$199 QUANTUM MAVRICK 540MB IDE 12ms 128K 2yr \$179 QUANTUM LIGHTNING 730MB IDE 11ms 128K 2yr \$249 TAPE BACK UP COLORADO JUMBO 350MB Internal \$145 CONNER 420MB Internal w/Tape \$169 WANG TEK 1.2GB Internal \$169 MONITORS MAG DX15F 1280x1024 NI 15" 60Hz \$335 MAG DX17F 1280x1024 NI 17" 60Hz \$599 GREEN 1024x768 280P NI EG-2-EG \$210 SPEAKERS 100 Watt Multimedia Stereo Speakers \$49 8 Watt Multimedia Speakers \$15	CD ROMS Mitsumi FX400 4X Quad Speed IDE Interface \$189 Acer CD-ROM 2X Speed IDE Interface \$99 Acer CD-ROM 4X Speed EIDE Quad \$179 NEC 3X1 CD-Rom 3X Speed SCSI \$199 NEC 4X1 CD-Rom 4X Speed SCSI \$309 Toshiba Quad Speed EIDE XM-5302 \$199 Toshiba Quad Speed SCSI XM-3501 \$309 TEAC SUPERQUAD Speed 4X AT Interface \$189 SOUND CARDS SOUND CARD 16 Jazz Mediavision 16Bit \$55 Creative Labs Sound Blaster Basic 16Bit \$75 Creative Labs Sound Blaster VIBRA 16Bit \$85 Creative Labs Sound Blaster SCSI-2 OEM \$119 Creative Labs Sound Blaster AWE32 \$279 CD TITLES Microsoft Family Pack (Encarta/Works/Money) \$99 (Golf/Entertainment Pack/Ancient Lands) \$99 Creative Labs Encarta 95 Encyclopedia \$99 New Grolier's Encyclopedia \$29 Iron Helix CD Game \$29 Doom Expert CD Title \$29 International Beauties Slides (Adults Only) \$29 MEMORY 4x32 16MB 70NS 72Pin SIMM \$489 4x32 16MB 70NS 72Pin SIMM \$559 2x32 8MB 70NS 72Pin SIMM \$289 2x32 8MB 70NS 72Pin SIMM \$325 1x32 4MB 70NS 72Pin SIMM \$169 1x32 4MB 70NS 72Pin SIMM \$145 4MBX3 70NS 30Pin SIMM \$129 4MBX9 70NS 30Pin SIMM \$139 *1MBX3 60NS IBM 30Pin SIMM \$42 *1MBX3 70NS 30Pin SIMM \$37 *1MBX9 70NS 30Pin SIMM \$45 TEAC FLOPPY DRIVES TEAC 1.44MB FDD \$36 TEAC 1.2MB FDD \$45 TEAC Dual Floppy 1.2/1.44MB FDD \$99 CONNER IBM	VIDEO CARDS Trident 8800 SVGA ISA 1024x768 w/1MB \$84 Trident 9440 SVGA VL or PCI 1280x1024 w/1-2MB \$129 Trident 9440 SVGA VL or PCI 1280x1024 w/2MB \$179 CIRRUS Logic 5429 SVGA VL 1280x1024 w/1-2MB \$79 3X SVGA PCI 1280x1024 w/1MB \$79 3X SVGA VL 1280x1024 w/1-2MB \$75 Diamond Speedstar Pro SE VL or PCI 1MB \$99 Diamond Stealth 64 DRAM VLB or PCI 2MB \$169 Diamond Stealth 64 VRAM PCI w/2MB \$279 Diamond Stealth 64 VRAM VESA w/2MB \$279 CONTROLLER CARDS PCI IDE Controller 2 HDD/2 FDD \$29 PCI SCSI Controller \$70 IDE I/O 2x1P/1G ISA \$16 Enhanced VL Bus IDE I/O Controller \$33 PROMISE CONTROLLER CARDS EIDE 2000 Plus VL-2 IDE 2H/W w/Super I/O 384 \$69 400VL-2 IDE 4H/2F IDE 0-16MB (512K Req.) \$115 400VL-2 IDE 0-16MB 2H/2F IDE \$115 400VL-2 SCSI/IDE 4H/2F IDE 0-16MB (512K Req.) \$209 DC5000 PCI IDE Caching 0-16MB (512K Req.) \$199 MODEMS 28.8/14.4Kbps Internal Fax Int V.34 \$135 14400BPS Voice Internal Fax/Modem/OEM \$69 14400BPS Internal Fax/Modem/OEM \$59 MOTHERBOARDS (NO CPU) Pentium 100/90 PCI w/EIDE I/O 256K \$199 Pentium 66/60 PC/EIDE I/O 256K \$129 ALI 486DX/2 4 100MHz PCI/VL 256K EIDE I/O \$149 PERCOMP 486DX4-100 256K OPTI 72/30 Pin \$99 C POINT 486DX/2 2VL BUS 256K AMI 30 Pin \$89 MOTHERBOARDS (WITH CPU) IBM 486SLC2-66 DPAL VLB 64K w/Math-Co 30Pin \$149 486SLC-40 w/Math-Co 128K 6 Slots \$129 386DX-40 w/Math-Co 128K 6 Slots \$99	CPU INTEL Pentium 100MHz \$549 Pentium 90MHz \$439 Pentium 60MHz \$269 486DX4-100MHz \$279 486DX2-66MHz \$189 486DX-33MHz \$145 CYRIX 486DX2-80MHz \$129 486DX2-66MHz \$99 486DX-33MHz \$89 MATH-COPROCESSORS 387DX-40 PGA \$35 387DX-33 \$35 C387-33PLCC HT \$29 387 DLA40 PGA \$29 AMD 486DX4-100MHz \$189 486DX2-80MHz \$149 486DX2-66MHz \$139 486DX-40MHz \$125 SPECIALS INTEL Pentium 90MHz 256K PCI w/CPU \$599 INTEL 486DX-66 256K VESA SLOTTED \$259 PERCOMP 486DX2-80 w/ CPU 3VL BUS 256K \$199 C POINT 486DX2-66/ CPU 2VL BUS 256K \$179 C O D. Cash or Cashier's Check/Telecheck/Visa & Master Card/P.O. accepted from Government/Schools & Qualified Companies. All product warranties are from the manufacturers. All prices, availability & products are subject to change without notice. All brand names are registered trademarks of their respective companies. Shipping is non-refundable. No cancellations on special order items not listed/15% Restocking fee on refunds & credits within 30 days. No Refunds or Credits after 30 days of invoice. CALL FOR SYSTEM CONFIGURATIONS AND 2 YEAR WARRANTY! Order 24Hrs. via Fax at 714.841.4262 or 800.690.7509 California & Colorado Office Hours: Mon - Fri 8:30AM-6:00PM Sat 10:00AM-4:00PM Colorado U.S. Computer Distribution 14677 E. Eagle Ave., Ft. Greenwood, CO 80112 Tel: 303.690.1093 • Fax: 303.690.7563 California U.S. Computer Distribution 16291 Galford St. Huntington Beach, CA 92647 Tel: 714.841.4081 • Fax: 714.847.7061
---	--	--	--

NEVADA

COMPUTER

For Tech Support & Customer Service
CALL TOLL FREE
800-982-2926

USA & Canada

WE BUY MEMORY FOR CASH OR TRADE

HOURS:
MON-FRI 7AM-5PM
SAT 9AM-2PM

We Ship

30 DAY MONEYBACK GUARANTEE

FAX (619)581-6756
4801 Morena Blvd., Ste. 1110
San Diego, CA 92117

WE WILL NOT BE UNDERSOLD

800-982-2926

THOUSANDS OF PRODUCTS AVAILABLE

SIMMS MODULES

30 PIN		72 PIN	
256 X 9	\$9.125.15 \$17	512 X 36 2mg	\$385 \$594 \$108
4 X 3 meg	118	1 X 36 4 meg	140 176 196
1 meg X 3	35 31	2 X 36 8 meg	288 376 378
1 meg X 3	34 40 42 46	4 X 32	480
4 X 8 meg	124	4 X 16 16 meg	518 538 586
4 meg X 9	129 139 148	8 X 36 32 meg	1175 1275
16 meg X 9	36 CHIP 668	16 X 36 64 meg	2695

SIPP ADD \$5.00

HARD DRIVES

MODEL	SIZE	MAXTOR	TYPE	PRICE
4220	420 mb	10 ms	3.5" IDE	\$175
540	540 mb	11 ms	3.5" IDE	189
7850	850 mb	11 ms	3.5" IDE	249
71260	1.26GB	11 ms	3.5" IDE	349

CONNER

CFA540A	420 mb	11 ms	3.5" IDE	175
CFA540A	540 mb	11 ms	3.5" IDE	189
CFA540A	850 mb	10 ms	3.5" IDE	245
CFA1275	1.27 gb	10 ms	3.5" IDE	365

SEAGATE

ST3660	545 mb	12 ms	3.5" IDE	190
ST3730A	730 mb	10 ms	3.5" IDE	239
ST31220A	1.08 gb	10 ms	3.5" IDE	349

WESTERN DIGITAL

1425	425 mb	12 ms	3.5" IDE	179
2450	540 mb	12 ms	3.5" IDE	209
2850	850 mb	10 ms	3.5" IDE	249
31200	1.2 gb	10 ms	3.5" IDE	359

QUANTUM

LPS 540A	540 mb	10 ms	3.5" IDE	182
----------	--------	-------	----------	-----

SCSI DRIVES

Conner CFP1060S	1.06 gb	9 ms	499
ST31290N	1.29 gb	9 ms	499

SEAGATE BARRACUDA

ST32550N	1 mg cache	200 p/s	SCSI 2 fast	999
----------	------------	---------	-------------	-----

IBM LAPTOP MEMORY

Model	Memory	Part #	Price
Thinkpad 300 Ambra Trek	2mb	33G9288	\$128
	8mb	33G9289	368
Thinkpad 350 350C 350 PS/Note		6060378	338
	16mb	6060379	647
Thinkpad 500 510CS 2618	4mb	8189098	198
	8mb	8189099	398
	16mb	07G1420	208
Thinkpad 700 700C 720 720C	8mb	07G1421	378
	16mb	6665109	888
	4mb	n/a	188
	8mb	n/a	318
IBM N45SL	2mb	92F8804	108
PS/2 N51 SLC SX	2mb	07G1826	98
	4mb	07G1827	188
	8mb	07G1828	418
Laptop N33SX L40SX & PS/NOTE 182	2mb	79F0999	98
	4mb	79F1000	184
	8mb	79F1001	358

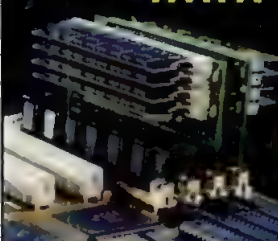
TOSHIBA MEMORY

Model	Memory	Part #	Price
T3200	3mb	PA7137U	\$184
T3300SL	2mb	PA2007J	238
	4mb	PA2007J	258
	8mb	PA2009U	698
	16mb	PA2009U	218
	32mb	PA2020V	399
	64mb	PA2021V	758
T4400 SX SXC T6400 SXC DXC	2mb	PA2003U	125
	4mb	PA2003U	198
	8mb	PA2005U	358
	16mb	PA2005U	698
	32mb	PA2010U	1548
T4500 T4600 T1900C	4mb	PA2012U	198
3.3volts T4700	8mb	PA2013U	388
	16mb	PA2014U	858
T5100	8mb	PA8301U	94
T5200 T5200C T8500 T5400	2mb	PA8304U	109
	4mb	PA8313U	418

COMPAQ MEMORY

Proline 325 & 252	2mb	141738-001	658
	8mb	141742-001	1118
Proline 486 486 4502mb Module	4mb	141683-001	94
	8mb	141684-001	178
Proline 486 486 4502mb Module	8mb	141685-001	338
Proline 486 486 4502mb Module	16mb	141686-001	684
Proline 486 486 4502mb Module	32mb	141687-001	1524
Proline 486 486 4502mb Module	64mb	141688-001	308
Proline 486 486 4502mb Module	128mb	141689-001	648
Proline 486 486 4502mb Module	256mb	141690-001	1348
Proline 486 486 4502mb Module	512mb	141691-001	2748
Proline 486 486 4502mb Module	1024mb	141692-001	5448
Proline 486 486 4502mb Module	2048mb	141693-001	10848
Proline 486 486 4502mb Module	4096mb	141694-001	21648
Proline 486 486 4502mb Module	8192mb	141695-001	43248
Proline 486 486 4502mb Module	16384mb	141696-001	86448
Proline 486 486 4502mb Module	32768mb	141697-001	172448
Proline 486 486 4502mb Module	65536mb	141698-001	344448
Proline 486 486 4502mb Module	131072mb	141699-001	688448
Proline 486 486 4502mb Module	262144mb	141700-001	1376448
Proline 486 486 4502mb Module	524288mb	141701-001	2752448
Proline 486 486 4502mb Module	1048576mb	141702-001	5504448

THE MINDEN GROUP
SIMMexpander
 your 1st total memory solution



Recycle 30 pin SIMMs
Get more 72 pin SIMM slots

- ◆ Adapts 30 pin SIMMS to 72-pin SIMM sockets
- ◆ Expands the number of 72-pin slots
- ◆ Reliable & easy to install
- ◆ Has memory protection logic

ME72430B, ME72430F

Connects four 30-pin SIMMS into one 72-pin SIMM socket

ME72830B, ME72830F

Connects four or eight 30-pin SIMMS into one 72-pin SIMM socket

ME72272B, ME72272F

Connects two 72-pin SIMMS into one 72-pin SIMM socket

ME72472B, ME72472F

Connects four 72-pin SIMMS into one 72-pin SIMM socket

ME30430B, ME30430F

Connects four 30-pin SIMMS into one 30-pin SIMM socket

Available in forward (F) and backward (B) facing models

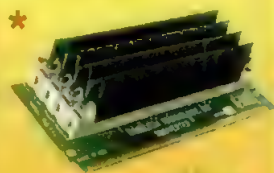
Distributor and reseller inquiries are welcome

The Minden Group, Inc. 1-800-746-3973

SIMMVERTER™
 Save \$100s in memory when upgrading to newer PC Systems!
 SimmVerter™ converts your old 30 pin SIMMs to 36 bit, 72 pin connector SIMMs.

...for only \$19 *

- ✓ Converts four 1MBx9 SIMMs to one 1MBx36 SIMM 4MB
- ✓ Converts four 1MBx9 SIMMs to one 4MBx36 SIMM 16MB
- ✓ Guaranteed to work on any system using 30 pin memory
- ✓ Works along with other 36 bit and even 42 bit SIMMs
- ✓ Up to 4 adapters can be installed with no side
- ✓ 4 models to choose from to fit any system
- ✓ Patented and designed in the USA



To Order call 1-800-440-7466

OEM, dealer & distributor inquiries welcome!

* Price per adapter. Add \$5 for shipping and handling and sales tax where applicable

CIRCLE 758 ON READER SERVICE CARD

1976 Lowmeyer Way
 San Jose, CA 95128
 PH: 408-937-0290
 FAX: 408-937-0391

GET THE MESSAGE - OR ELSE!

WINDOWS-BASED

- ◆ Voice Mail
- ◆ Auto - Attendant
- ◆ Fax - On - Demand
- ◆ Packages from \$295

1-800-934-4884

(Developer/OEM packages available) VISA - MC - AMEX - COD

Don't trade your life for a lost message!

TALKING TECHNOLOGY, INC.

1125 Atlantic Avenue, Alameda, California, 94501
 Voice 510-522-3800 Fax 510-522-5556



CIRCLE 757 ON READER SERVICE CARD

SIMMSTACK™
 30pin to 72pin SIMM Conversion



- ✓ Install four 30pin SIMMs into one 72pin Slot
- ✓ Also Available: Install two 72pin SIMMs in one 72pin slot

SEERMAX

800-209-7126

CIRCLE 756 ON READER SERVICE CARD

ROM BIOS UPGRADES

Do you need new AMI, Award, MR BIOS or Phoenix BIOS?

Support Windows 3.1/Chicago
 Support 1.2/1.44/2.88MB
 Floppy Drives
 User defined hard drive types
 Enhanced IDE
 100% IBM compatible
 Hard drive support beyond 1K cylinders
 52 bit block mode transfer
 Four floppy support
 Four serial port support
 DOS 6.x
 Three levels of password protection
 Complete set up in ROM

**WE ARE THE OLDEST AND LARGEST
 BIOS UPGRADE IN THE WORLD.
 GUARANTEED LOWEST PRICES
 ALL THE TIME.**

ORDER TODAY!

1-800-800-BIOS

MA, FL, CA OFFICES
 RETURNS MAY BE SUBJECT TO A RESTOCKING FEE

UNICORE
 SOFTWARE

1530 TURNPIKE ST. • NORTH ANDOVER, MA 01845
 (508) 886-6468 • FAX (508) 881-1650

ACER AND AST COMPAQ DELL DTK IBM EPSON EVEREX GATEWAY HUNDAL KATPRO LEAD NG EDGE
 MICROLOGIC MINITRAC SAMSUNG SANYO SPERRY TANDY WELLS AMERICAN WYSE AND MANY MORE

CIRCLE 754 ON READER SERVICE CARD

3981 F Miraloma Ave
 Anaheim, CA 92806
 Tel: 714/817-7600 Fax: 714/817-7700

6050 -X McDonough Dr
 Norcross, GA 30093
 Tel: 404/446-1464 Fax: 404/446-1465

SHECOM

30PIN SIMMS FOR PCs

1M X 3 70ns	\$37.00
1M X 9 70ns	\$40.00
4M X 8 70ns	\$119.00
4M X 9 70ns	\$135.00
16MX 9 70ns	\$545.00

72PIN SIMMS FOR PCs

1MX36 70ns	\$155.00
2MX36 70ns	\$310.00
4MX32 70ns	\$430.00
4MX36 70ns	\$525.00
8MX36 70ns	\$1045.00
16MX36 70ns	\$2225.00

WE Stock

AST
COMPAQ
TOSHIBA
to
NEC
hp
UNIB
MEMORY

LAZER PRINTER MEMORY

DESIGNER 8000000	\$38
DESIGNER 16MB	\$164
DESIGNER 32MB	\$148
STANDARD	
XPRESS 8000000	\$205
PANASONIC	
KNP 4000000	\$127
FAIRCHILD 4000000	\$112
VERTEC 4000000	\$104
OKIDATA	
DL 4000-4100	\$122

POs from Govt. Corporate, Schools & Univ. WELCOME

Prices are subject to change without notice.

WEST COAST **EAST COAST**

CIRCLE 755 ON READER SERVICE CARD

4 MEG recycled MEMORY \$49.00
16 MEG recycled MEMORY \$49.00
 (You provide the memory, AUTOTIME provides this)

SIMM 4 RECYCLER



Recycle your 30 pin SIMMs for use in 486 & Pentium

- 5 IC design for Hi-Speed Pentium performance
- Supports all 30 pin SIMM types (2, 3, 6, 9 chips)
- No DIP switches—Plug & Play installation
- Recycling 4 pcs of 1 Mb SIMMs saves \$150
- Recycling 4 pcs of 4 Mb SIMMs saves \$600
- Patented Flip-Design—May install front or back

AUTOTIME Corp.
 6605 SW Macadam
 503-452-8577 FAX 503-452-8578
 Internet: info@autotime.com

"SIMM 4 RECYCLER" \$49.00
"SIP 4 RECYCLER" \$49.00

CIRCLE 759 ON READER SERVICE CARD

WE WILL BEAT ANY ADVERTISED PRICE!



4801 Morena Blvd.
Suite 1111
San Diego, CA
92117

Fax (619) 581-0125
Customer Service
(619) 581-1430

TOLL
FREE

800-581-6040

No surcharge on
credit cards
P.O.s accepted
from
Universities and
Qualified Firms

PC MAG 6.9.93



Call us for
Unbeatable Prices!

Pacific Coast Micro specializes
in all your storage needs...if
you see it advertised at a lower
price, we will BEAT IT!

IDE HARD DRIVES

Mapstor					WESTERN DIGITAL				
MODEL	SIZE	SPEED	TYPE	PRICE	MODEL	SIZE	SPEED	TYPE	PRICE
742U	400MB	10MS	3.5" IDE	\$164	AC1425	425MB	12MS	3.5" IDE	\$179
754C	540MB	11MS	3.5" IDE	169	AC2540	540MB	12MS	3.5" IDE	194
785C	850MB	11MS	3.5" IDE	224	AC2850	850MB	10MS	3.5" IDE	239
7105L	1.09GB	11MS	3.5" IDE	343	AC31300	1.08GB	10MS	3.5" IDE	319
71260	1.26GB	11MS	3.5" IDE	349	AC31200	1.2GB	10MS	3.5" IDE	329

CONNER					Quantum				
MODEL	SIZE	SPEED	TYPE	PRICE	MODEL	SIZE	SPEED	TYPE	PRICE
CFS420A	420MB	12MS	3.5" IDE	\$159	TB420A	420MB	13MS	3.5" IDE	\$174
CFS40A	540MB	11MS	3.5" IDE	174	MVS40A	540MB	14MS	3.5" IDE	182
CFAR50A	850MB	10MS	3.5" IDE	234	LT540A	541MB	11MS	3.5" IDE	214
CF41275	1.2GB	10MS	3.5" IDE	339	LT310A	731MB	11MS	3.5" IDE	219

Seagate					SCSI DRIVES				
MODEL	SIZE	SPEED	TYPE	PRICE	CONNER	CFP1060S	1.06GB	9MS	\$479
ST3401A	400MB	14MS	3.5" IDE	\$159	ST31230N	1GB	9MS	9MS	491
ST360A	540MB	14MS	3.5" IDE	174	SEAGATE BARRACUDA	1 MB CACHE	7200 RPM	SCSI 2 FAST	
ST380A	700MB	12MS	3.5" IDE	219	ST32550N	2.1GB	8MS		\$944
ST380A	850MB	12MS	3.5" IDE	235					
ST31220A	1.06GB	12MS	3.5" IDE	299					

LASER PRINTER MEMORY

HP110 11P, 111 11P,
11D, & 11P+

2mb \$119
4mb 167

HP 110s, 4, 4m, 4si, 4simx
4mb 194
8mb 352

HP Deskjet 500 500C,
550C 256K 42

HP LJ 4L 1mb 54

IBM 4019 4019E 112
2mb
IBM 4029 Series 2mb 98
Panasonic 4410, 4430,
4420 4450 92
2mb
4mb 168

MOTHERBOARDS

American Made Boards

SUPER MICRO P75, P90, P100

Byte Magazine - "Best Overall"
and PC Magazine -
"Editor's Choice Award"

8mg to 128mg, 4-72 pin Simms, 4 PCI, 1 Vesa, 5 ISA
75 90 100 120 Selectable 8x13 Also 4 PC 4
ISA INT E-IDE Controller and Opt-Viper Chip Set

	256K	512K
P75	\$560	\$600
P90	707	737
P100	832	872
MB w/o CPU	225	265

CYRIX 486 ISA

8 ISA Slots, Am Bios, Opt Chip Set 256 K-Cache Upgradeable to 486 DX CPUs
8-30 P/N Sockets 486 DLC 40 \$129

SUPER MICRO P55 EWA

8mg to 128mg, 4-72 pin Simms, 4 PCI, 4 ISA, Bus Master PCI, IDE
Mode 3 and 4 Supports, Works on
75 through 100 MHz. Supports
ECC memory, Flash AMI WIN
BIOS, Intel Triton Chip Set, 8x11

	256K	512K
P75	\$605	\$665
P90	772	782
P100	877	937
MB w/o CPU	270	330

FASTEST
BOARD
AVAILABLE

Lifetime
Warranty
on all
MEMORY PRODUCTS

NEW LOW
PRICES

INSTALLATION GUIDES INCLUDED

SIMMS

ALL SPEEDS AVAILABLE

1X3-70 \$37	1X36-70 \$148
1X8-70 \$38	2X36-70 \$206
4X9-70 \$126	4X36-70 \$468
16X9-70 \$570	8X36-70 \$1058

VIDEO cards...

Cirrus Logic SVGA-VLB 1-2 1MB Upgradeable to 2MB \$85

DIAMOND PRODUCTS

SpeedStar24x	ISA, max 1024x768 NI 20MHz 24-bit 16.7m colors	\$119
SpeedStarVL	VL Bus, 16 mi WinMark 1MB 16.7 MI Colors 20MHz	119
ViperVLB	VL Bus, 4MHz, 2MB, VRAM Wefield P9000 60 Million WinMark 3MB	299
Death 64 PCI w/ VLB	4MB	279
Death 4.5 PCI w/ VLB	4MB	439

FAX MODEMS

14.4 Internal	\$59
14.4 Internal w/voice	.65

U.S. Robotics Sportster

14.4 Internal	.95	14.4 External	105
28.8 Internal	215	28.8 External	234

CD ROMS

IDE QUADSPIN

MITSUMI
FX400 \$175

TEAC
CD-55A 185

TOSHIBA
XM5302 239

SCSI QUADSPIN

NEC
4XI \$310

SANYO
CRD-2545 265

8 SPEED SCSI
Plexor
Plexor \$350

MATH COs

83D8733...\$25
83D8740...33
83D8733...29

CPUs

1486DX4-100	\$245
1486DX2-66	180
1486DX-33	145
CX486DLC-40	49
CX486DLC-33	42
586 P75	320
586 P90	379
586 P100	449

TAPE DRIVES

Colorado Jumbo 250	\$139
Colorado Jumbo 350	165
Conner 420	165
Tracker 250	269
Tracker 350	329
DC2120 Tape 250 MB	15
DC2120 XL Tape 350 MB	20
DW5122 Tape 420 MB	22

800
TOLL
FREE
CUSTOMER SERVICE

CREATIVE

DISCOVERY 10

**QUADESPEED
SPEAKER**
Soundblaster 16
2 Labtec Speakers
The New Grolier
Multimedia Encyclopedia
Eagle Eye Mysteries
Wing Commander 2
Pagan Ultima 8
Syndicate Plus
Strike Commander
Peter Pan

357

MONITORS

WAE Imaxvision

DX15F-15" 28DPI NI 60KHz	
Flat, MPRII 110 x0K	\$335
DX17F-17" 26DPI NI 60KHz	
Flat, MPRII	609
MX15F-15" 28DPI NI 60KHz	
Flat, MPRII	438

ViewSonic

15G 15" Monitor

1280x1024 NI 60Hz
26DPI \$399

17G 17" Monitor

1280x1024 NI 60Hz
28DPI 745

20G 20" Monitor

1600x1280 NI 76Hz
28DPI 1319

IMPRESSION

3 14" 28 NI 1024x768	\$219
5 15" 28 NI 1280x1024	325
7 17" 28 NI 1280x1024	569

LOW COST SHIPPING RATES AVAILABLE HOURS: MON-FRI 7AM-5:30PM P.S.T. SAT. 10AM-1:30PM P.S.T.

Shipping to non-continental US destinations at special rates. Orders shipped within 48 hours. No returns after 30 days. Minimum replacement only. All prices listed. Prices subject to change. Manufacturer's price controls for convenience only. Hardware not registered with their respective companies.

Our Family Tree is Branching Out!



**AutoBoot
Commander**

The original AutoBoot; lets you monitor and operate multiple PCs or file servers with just one keyboard, monitor and mouse.



**Personal
Commander**

All the features of the AutoBoot in a smaller, more personal size. Measuring under 8" across, the Personal Commander is perfect for the desktop.



**Slimline
Commander**

The most streamlined member of the AutoBoot family. At only 1.75" high, the Slimline Commander can be fitted easily into your computer rack using a minimum of space.



**AutoBoot
Commander 4xP**

Adds multiuser, multi-media & multiplatform capabilities to the Commander line; up to 4 users can access multiple PC, Mac & Sun computers from one central location!

Cybox Corporation
4912 Research Drive Huntsville AL 35805 USA
(205) 430-4000 (205) 430-4030 fax



PC is a registered trademark of International Business Machines Corporation. Mac is a registered trademark of Apple Computer, Inc. Sun is a trademark of Sun Microsystems. Cybox, AutoBoot, Slimline, and Commander are trademarks of Cybox Corporation.

**SEE US AT NETWORKS EXPO, DALLAS, SEPT. 12-14 BOOTH#1696
AND AT NETWORKD + INTEROP, ATLANTA, SEPT. 27-29 BOOTH #5166**



CIRCLE 761 ON READER SERVICE CARD

Lose 500 pounds in 10 minutes



with a Rose keyboard monitor switch

Call today for free catalog

- ◆ Print servers
- ◆ Data switches
- ◆ Keyboard/video control

1-800-433-9343

P.O. Box 742571 ♦ HOUSTON, TEXAS 77274
TEL 713/933-7673 ♦ FAX 713/933-0044

Streamline your computer room by reducing excess equipment. Access up to 256 CPU's from a single keyboard, monitor, and mouse. ServeView is our best-selling switch, has every feature you can imagine, and installs in minutes. Compare price, features, performance, quality, and support and you'll find Rose can't be beat.

Call us to discuss your application
or to receive your free information kit.

ROSE
ELECTRONICS

CIRCLE 780 ON READER SERVICE CARD

Don't wait! Fly a WEDGE 120MHz Pentium Notebooks with Built-in CDROM!

With Windows 95 you could use a 300% performance increase and a built-in CD-ROM to boost your Multimedia Applications. Why wait for your computer to keep up with your capabilities when you can get the ultimate notebook. *Call now!*



1800-872-9334

Pentium 90, 100 or 120MHz CPU
Built-in CD-ROM & Glide Point
11.3" LARGE display
2MB Video RAM

PCI Bus Design
Upto 64MB of RAM
Infra Red Communication
Upto 6 Hours Battery Life

Providing a full line of notebooks & desktops

486-66 MHz notebook ... start at \$1,295

WEDGE SINCE 1987
TECHNOLOGY, INC.
Your Partner for Success
1657 Midlandless Drive, Modesto, CA 95035
Sales: 408/263-9888 Fax: 408/263-9886
Tel: 408-263-9888 Fax: 408-263-9886 Fax-On-Demand: 408-263-9958 (Doc #5)
Email: wedge@aol.com **1-800-USA-WEDGE (872-9334)**

CIRCLE 762 ON READER SERVICE CARD

REMOTE POWER ON/OFF **\$169.95**

- Power on your PC from anywhere in the world!
- Reboot a Locked-up Remote PC.
- Share a Modem & Fax Machine on a single phone line.

Plus \$199.95

Wipe ANYWHERE
1.0 for Windows
30-DAY TRIAL!
MC / VISA Accepted

1288 Hammerwood • Sunnyvale CA 94089 • Ph 408-745-0300 • Fax 408-745-0392

TO ORDER CALL 1-800-835-1515

CIRCLE 763 ON READER SERVICE CARD

PHOTO PAD

**Personalized Mouse Pads
From Your Photos**

- Great for gifts
- Family members love them
- Promote your product

To order:

1. Send photo sandwiched between cardboard
2. Enclose name, address and phone #
3. Enclose check or credit card # with exp. date
4. CA residents add applicable sales tax

Send to:
PhotoPad
P.O. Box 13370
Sacramento, CA
95813-3370
(916) 929-8181

(includes shipping)

CIRCLE 764 ON READER SERVICE CARD

When you buy from Boxlight, you'll get the exact system for you needs. We don't limit you to just a few products. You can choose from over 50 models in stock. Our

All-in-one Color. No OHP Needed.

- Sleek, stylish design.
- Compatible with PC or Mac.
- Less than 20 lbs. travel weight.
- Includes free remote control.

\$3999

Boxlight ColorShow™ 2000

trained people will ask you questions and guide you to the exact solution for your situation, sometimes at a lower cost than you might have thought possible. ■ And, we guarantee to ship your order in less than

Affordable Color. Classy Package.

- Brightest color at any price.
- New faster response time.
- Compact, portable design.
- Free remote & cables.
- Mac or PC Compatible.

\$1999

Boxlight ColorShow™ 1200



WHEN WORDS ARE NOT ENOUGH...

Purchase Orders Accepted (some restrictions apply)

CALL BOXLIGHT!

Leading and Rental Customers Available

1-800-762-5757

Monday through Friday 6am-5pm, Pacific Time
All Boxlight products carry a 30 day no risk money back guarantee!

CALL FOR THE LATEST SAVINGS



24 hours wherever you need it even if that means multiple locations worldwide. ■ When your new equipment arrives, it's ready to go. Set-up is about as simple as using a toaster. If you ever have questions or need help, our Technical Support Group is standing by with free after-the-sale phone assistance. Every work day. Forever. No charge.

Active Matrix Color at a Passive Matrix Price. Outstanding Value!

- 47" x 35" active matrix color LCD
- 100% brightness, 100% contrast
- 100% color accuracy
- 100% reliability

\$2999

Boxlight ProColor™ 1301

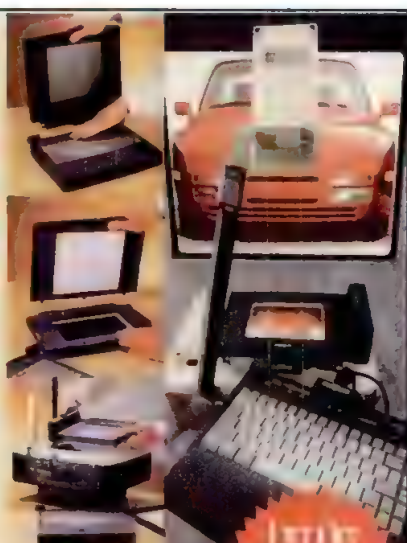
Purchasing presentation equipment doesn't get any more convenient. Just pick up the phone and dial. There's absolutely no risk in buying from us, because if you're not happy with your purchase, call us within 30 days and return it for your money back. No hassle. No risk!

CIRCLE 765 ON READER SERVICE CARD

NOTEBOOK COMPUTER

The 4800/4
Notebook C200
by Boxlight

WITH A
SIX-FOOT
SCREEN!



Purchase Orders Accepted (some restrictions apply)

CALL NOW!

Leading Options Available

1-800-762-5757

Fax: (360) 778-3286 • Qwery: (800) 487-4006
Resellers: (800) 738-8886 • Int'l: (360) 778-7901

Monday through Friday 6am-5pm, Pacific Time

Why buy from Boxlight Direct?

- Competitive pricing
- Fast service
- Free remote control
- Free shipping
- Free technical support
- Free 30-day money back guarantee
- Call and ask for a free catalog

BOXLIGHT
DIRECT

Inc 500

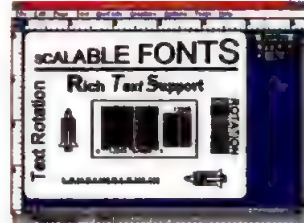
multibook
by design



The Next Generation in Label Design Software

LabelWorks™

for Windows



LabelWorks sets the new performance standard for professional quality label design. No other program combines such easy operation with this much power!

- Provides Desktop Publishing features to enhance label design. Features include: WYSIWYG, rulers, guides, page zooms, lines, shapes.
- Rich text support allows you to edit font styles, types, and sizes within the same line.
- Supports all major Bar Code symbologies, including Code 39, 93, 128, POSTNET, UPC, Bookland EAN, 19 types in all.
- Imports & Exports using TIFF, GIF, BMP, PCX, WPG, WMF, TARGA graphic files.
- Rotates Text, Bar Codes and imported graphics in 90 degree increments.
- Prints labels on virtually any windows supported printer.
- Prints labels directly from dBase, dIF & ASCII files.

Dealer Inquiries Welcome.

Call for Free DEMO Software



AMERICAN MICROSYSTEMS

2190 Regal Parkway, Euless, TX 76040

(800) 648-4452 (817) 571-9015 FAX (817) 685-6232

CIRCLE 766 ON READER SERVICE CARD

Plug & Play Solutions For PCs

9-Track, 3480, 3490, 3490E

One manufacturer gives you the widest variety of solutions, each with a tape drive, controller, and powerful software. And each is backed by the company that builds it: Overland Data. Call today for an information kit.

619-571-5555 • Fax 619-571-3654
Europe: +44-1753-891891 • Fax: +44-1753-891897
Email: info@overland.com • <http://overland.com/pubinfo/sales>
Web: <http://www.overland.com/infosales>

Overland Data

800-729-8725

CIRCLE 767 ON READER SERVICE CARD

YES! YOU CAN TAKE IT WITH YOU!

NOW YOU CAN HAVE FULL PORTABILITY AND SECURITY FOR YOUR VITAL DATA!

► The dataport removable storage module is the perfect solution. It provides security, portability, on-line backup, and hot-removability for raid operations.

- FORMFITTED FOR STANDARD 5.25" HALF HEIGHT BAYS
- ACCEPTS ALMOST ALL HALF HEIGHT 3.5" DRIVES
- EASY INSTALLATION

US PATENTS RE #34,369 DES #308,052

CALL TODAY!
1-800-260-9800

CRU
CONNECTOR RESOURCES UNLIMITED, INC.

CIRCLE 771 ON READER SERVICE CARD

MAC SUN UNIX DOS WINDOWS AIX OS2

Your Tape Connection Source

- ✓ Best Product
- ✓ Best Price
- ✓ Most Reliable
- ✓ 1 year Onsite Warranty

Featuring
FUJITSU
Quality Products

(800) CPU-3480

Computer Peripherals Unlimited Inc.
2355 N. Stevens Blvd. Suite C • Flagstaff, AZ 86004
(520) 526-2261 Phone • (520) 773-9183 Fax

3480 3490 3490E 9-Track 8mm 4mm

CIRCLE 768 ON READER SERVICE CARD

DATA SOLUTIONS YOU CAN DEPEND ON

9-TRACK/3480/3490/3490E

- ✓ TAPE BACKUP
- ✓ DATA CONVERSION
- ✓ TAPE DUPLICATION

REMAX ELECTRONICS, INC.
1348 EAST 15TH ST. BURNSVILLE, MN 55337

TEL: (612) 890-9080
FAX: (612) 890-9111

800-396-6116

CIRCLE 772 ON READER SERVICE CARD

9 TRACK/3480/CDROM

WINDOWS DOS NOVELL OS2 UNIX

Windows NT Software!
Tape Backup/Conversion
Tape Duplication
CD ROM Maker

LAGUNA DATA SYSTEMS
FAX: (702) 655-6397

800-938-TAPE

CIRCLE 769 ON READER SERVICE CARD

Tape Solutions

...The Tape Experts

- 9 TRACK
- 3480 • 3490 • 3490E
- LIBRARIES

Qualstar Corporation
6709 Independence Avenue
Canoga Park, CA 91303

FAX (818) 592-0116 TEL (818) 592-0061
(800) 468-0680

CIRCLE 773 ON READER SERVICE CARD

SyQuest
TECHNOLOGY

Unlimited data storage at blazing 13 ms access speed and up to 4 MB/s transfer rate. Wake up DOS & Windows world to the SyQuest storage technology that dominates the media service bureau industry with a 98.5% penetration. It obliterates optical technology with its speed and low cost. Can you imagine 270 MB on a disk the size of your floppy diskette. Available in the Liberty small form factor (shown left) with or without internal battery or as an internal kit for your PC. Never run out of storage again, throw away those slow back up tapes and be on line immediately.

SyQuest 270MB 3.5" REMOVABLE CARTRIDGE DRIVE
13 ms

Liberty

375A Saratoga Ave.
San Jose, CA 95129

(408) 983-1127
Fax (408) 243-2885

CIRCLE 770 ON READER SERVICE CARD

Will your 9-Track Subsystem...

- ✓ Offer tape speeds from 100 to 150 ips?
- ✓ Read and Write all four 9-Track Densities?
- ✓ Work in concert with other SCSI-2 devices?
- ✓ Be backed by a company who has produced 9-Track drives for over 20 years?

Features like these make **M4's** solutions the only choice for your demanding high performance applications.

....3480/90 Solutions also in-stock

M4
10855 Sorrento Valley Rd. San Diego, CA 92121
619-597-0516 Fax: 619-597-0936

800-240-8270
8 AM Eastern to 5 PM Pacific

CIRCLE 774 ON READER SERVICE CARD

Your Data Interchange and Storage Expert

Nine Track Tape Systems

All Densities—

800-1600-3200-6250

101 GB

Optical Jukebox

HP compatible

East Coast

800-828-0599

Fax

216-349-8609

3480/3490/3490E

RAID Solutions

3-35 Disk Support

RAID level 0-3-5

West Coast

800-928-9099

Fax

602-548-9041

4mm, 8mm, and DLT!

CD ROM Recorders

Novell

3.x + 4.x

CD ROM Jukebox

100 and 150 disk capacity



Corporation

31200 Carter St.

Solon, OH 44139

CIRCLE 775 ON READER SERVICE CARD

TV ELITE... The Complete Presentation System!

The leader in Big Screen Presentations just got better! TV Elite connects to any video capable TV in just seconds and produces excellent quality VGA to TV conversion for business meetings or multimedia presentations. TV Elite includes, "TV TOOLS" with 65 on screen tools such as ZOOM, DRAW, SPOTLIGHT, BREAK TIMER, and "SLIDE WORKS" the ultimate in quick and easy slideshows. TV Elite now ships with the TV Elite REMOTE + MOUSE a Windows remote control mouse. a \$179 value FREE!



FREE REMOTE + MOUSE \$179 value

(800) 888-5244

Advanced Digital Systems • (310) 926-1928 • FAX (310) 926-0518



CIRCLE 776 ON READER SERVICE CARD

Presenter

Connect Your PC To Any TV For Better Presentations

"Video quality ranks among the best we've seen from a portable scan converter." —Windows Sources, January 1995

Consumer Technology's "New technology makes Windows rock-solid on TVs." —InfoWorld, Brian Livingston

For information and a dealer near you, please call:

800/356-3931

Consumer Technology Software Inc.
10000 E. 1st Avenue, Suite 100
Denver, CO 80231
303.643.1662

The Presenter 3 - \$349 ^{SFP}

For 15" and 17" monitors, outputs to 16:9 monitors

The Presenter Sound 3 - \$429 ^{SFP}

For 15" and 17" monitors, outputs to 16:9 monitors

MADE IN THE USA

VOTED THE BEST MULTIMEDIA SOUND CARD. PERIOD.



Turtle Beach has done it again! Tropez™, our first 100% game compatible sound card, has won the coveted PC Magazine award for being the best sound card in its class! That's what happens when you combine sterling, 16-bit, CD quality digital audio with realistic wavetable synthesis.

Tropez also includes:

- The best digital audio, with sample rates up to 48kHz.
- Wavetable synthesizer with 128 realistic General MIDI instruments, 2 megs ROM.
- SampleStore™... lets you add an unlimited number of new instruments of your choice, up to 12 megs RAM.

- New, enhanced IDE CD-ROM connector
- Plus, loads of excellent music and gaming software!

See your favorite computer dealer, or call 800-848-6848 today for more information or the Turtle Beach \$5 demo CD!



TURTLE BEACH SYSTEMS

52 Grumbacher Road • York, Pennsylvania 17402
717-767-0200 • 1-800-848-6848 • FAX 717-767-6033

A Division of Integrated Circuit Systems



CIRCLE 776 ON READER SERVICE CARD



CDROMS!

"This company has a crop of neat CD-ROMs"—John Dvorak, PC Computing. Call now for your FREE catalog!

Cica MS Windows

Slackware Linux

Simtel MSDOS

FreeBSD Version 2.0

Hobbes OS/2 Archived

Hobbes Ready-to-Run

Giga Games 2

C Users' Group Library

QRZ! Ham Radio

Perl

Clip-Art Cornucopia

Project Gutenberg

Source Code

Internet Info 3/95

Science & Tech Library

Ads

Space and Astronomy

Doom 1 Shareware

Toolkit for Doom

Fractal Frenzy

CDROM Caddies

Two disc set! 1072 MB New Windows programs. Games, \$29.95*

utilities, drivers, code, fonts. Indexes in six languages \$29.95*

Two disc set! Slackware 2.2 distribution of Linux, install \$39.95

from CDROM. XFree86 3.1, Tcl/Tk, GCC, "The best \$39.95

Linux distribution... simple to install."—PC Week, April 1994

Two disc set! 10,000 MSDOS files. Utilities, comm, \$34.95*

games, BBS programs, programming tools, source code \$34.95*

Berkeley BSD 32bit O/S for PC, w/ GNU & XFree86, \$39.95

C++ compilers, source code! 100% stable. Our 400 \$39.95

user ftp/www site runs FreeBSD. (ftp.cdrom.com)

600 MB S/W OS/2 Mag. Product of the Year! 5/95 \$29.95*

Installed OS/2 emacs, GCC, TeX, AVI movies & more! \$39.95

3000 hot new games for MSDOS and Windows. 3/95 \$39.95*

C Users' Journal Archive. C source code & articles \$49.95*

FCC callsign database for Win & DOS + 200 MB files \$29.95*

Popular, easy new language. 7000 files of src & utils \$39.95

5050 B&W clip art images, PCX and WPG format \$39.95

Classic literature, novels, and historical documents \$39.95

650 MB of Unix & DOS source code for programmers \$39.95

13,000 computer, net, and Internet doc's. RFC's, faq's \$39.95

Technical, engineering, math. Win/DOS. 96 pg. book \$39.95*

Two disc set! Programming tools, source code and docs \$39.95

Thousands of NASA images and data files \$39.95

#1 VR game, 3-D graphics, fast & brutal action \$9.95*

500 levels for registered Doom 1 & 2, editors, hints! \$19.95

2000 high resolution fractals - plus royalty-free images \$39.95

Standard type, highest quality, lifetime guarantee! \$4.95

* Shareware programs require separate payment to authors if found useful.
* Subscriptions: we ship new version to you automatically, update about quarterly.
Shipping costs: \$5 US/Can/Mex \$9 overseas • Distributors Welcome!

Call 24-hours! 1-800-786-9907

+1 510 674-0783 x 515 • Fax +1 510 674-0821 • Email orders@cdrom.com



Walnut Creek CDROM

Suite D-515, 4041 Pike Lane • Concord CA 94520 USA

All our CDROMs are unconditionally guaranteed.

Adcode: 515

CIRCLE 777 ON READER SERVICE CARD

Wireless Printing

NEW!

GoPrint

Share Printers Without Wires or a Network

Wireless Printer Sharing

GoPrint is as fast as printing through a wired connection and faster than printing over a network. GoPrint saves you the cost of wiring and installing an expensive network. And, since GoPrint is plug-and-play ready, in minutes your printers can now be located where you need them. Even if they are located behind walls or around corners.

- ▲ Up to 8 printers can be used by any number of PCs.
- ▲ Prints up to 500 feet indoors.
- ▲ Works with 100% IBM compatible PCs and printers.
- ▲ Both DOS and Windows.
- ▲ Uses high performance 2.4 GHz Spread Spectrum Radio.
- ▲ Plugs into computer's parallel port and printer's Centronics connector.
- ▲ Adapter required for each PC and printer.
- ▲ No additional software or cards.



RISK FREE
MONEY-BACK
30 DAY
GUARANTEE

1-800-492-2320

Lanacom, Inc. 13228 W 98th Lane, KS 66215
Lanacom is the property of the respective owners.

CIRCLE 782 ON READER SERVICE CARD

Lanús NETWORK OPERATING SYSTEM

Fast, easy MS-DOS networking software

- ▶ Share CD-Roms, Hard Drives, Floppy or Ram Drives, Modems and Printers.
- ▶ Installs quickly and is much easier to use than any other networking software.
- ▶ Works with Windows 3.1
- ▶ Full featured product providing network application services.
- ▶ Combined Client/Server networking with Peer-to-Peer features.
- ▶ Supports a wide variety of network adapters.
- ▶ Lanús is superior to other network software in performance, effectiveness and efficiency.
- ▶ Lanús client program combined with network interface drivers occupies less DOS memory than the competition.
- ▶ 25/50/100 User versions also available.
- ▶ UNIX-like file and directory security.
- ▶ LINUX / UNIX and OS/2 Warp servers for MS-DOS clients available for the same price.



\$89⁹⁵



\$149⁹⁵

5 USER

1-800-333-4332

10 USER

LANUS INC. SUITE 510, 8876 GULF FREEWAY, HOUSTON, TEXAS 77017

CIRCLE 778 ON READER SERVICE CARD

SHARE PRINTERS

and a lot more...

HIGH PERFORMANCE

At 180,000 cps parallel and 115,200 bps serial, Buffalo boxes are the fastest. Up to 16mb of buffer available

FASTER PRINTING

Sharing devices so fast they speed up printing using Windows. It's twice as fast as the new Windows Printing System.

EASE OF USE

Transparent to users. Optional printer selection software included. Connect with standard parallel and serial cables

FLEXIBILITY

Eleven models in all parallel, all serial or in combination. Configurable I/O options. Models are easily cascaded together.

VALUE

With non-buffered autoswitches starting at \$59 and intelligent sharing devices from \$349, Buffalo has the right sharing solution for you.



We also make 72 contact

PC SIMMS!

1-800-345-2356



BUFFALO

2805 19th St SE Salem, OR 97302
(503) 585-3414 • FAX (503) 585-4505

Buffalo is a registered trademark of Buffalo. IBM is a registered trademark of International Business Machines Corporation. All other trademarks are the property of their respective owners.

CIRCLE 790 ON READER SERVICE CARD

CONTROL ALL YOUR PC SERVERS

FROM ONE KEYBOARD, MONITOR AND MOUSE

• 2-64 Computers

• Any mix of PCs;
PS/2 & Serial Mouse

• All Mac & Sun



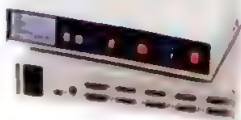
• Post Panel &
Keyboard Selection

• Autoselect™

• Keyboard/Mouse
Simulation

• Locking or
Kick Mount

• Remote Access to
160*



MasterConsole®

*See us at Enterprise Computing
Chicago, July 20-28, Booth #1254

*See us at Midwest Edge

Dallas, September 12-14, Booth #1790

*See us at Networld + Interop

Atlanta, September 25-29, Booth #4040

(800) RCI-8090 Ext. 81

10-1 Ilene Court, Belle Mead, NJ 08502
(908) 874-4072 FAX (908) 874-5274

sales@raritan.com ■ http://www.raritan.com



RARITAN COMPUTER, INC.

30-DAY MONEY BACK GUARANTEE FULL-YEAR WARRANTY

CIRCLE 781 ON READER SERVICE CARD

24 HOUR HARDWARE SUPPORT NO WAITING

Locate technical information on over
7,000 PC hardware components in
seconds using our CD-ROM.

Put all those bulky manuals back on
the shelf. We've packed the equivalent of over 50,000
pages of critical PC hardware information for fast access on
your desktop.

- Product coverage on over 1,700 different manufacturers' products including clone, outdated, no longer supported and unidentified models
- Illustrated glossaries of terms and components with easy to understand tables.
- Extends the lifespan of outdated or unsupported PC hardware.
- Complete configurations, diagrams, jumper settings, component locations, and vital need-to-know information on PC hardware.
- Simple to use, powerful search engine makes product location and information retrieval an efficient process saving many hours of down time and thousands of dollars in support costs.

What others are saying

- It's great to go to one source and get information on such a large array of equipment. — *Gateway 2000*
- It's a gold mine for anyone trying to support some PC's and PC users. — *Computer Shopper*

call 800-926-8299



4900 Pearl East Circle, Suite 101 • Boulder, Colorado 80301

Corporate 303 443 3388 • Fax 303 443 3323 Industrieweg 7, 5731 HP

Mierlo, The Netherlands • 31 4927-60900 fax • 31 4927-64040

TCPCME

CIRCLE 784 ON READER SERVICE CARD

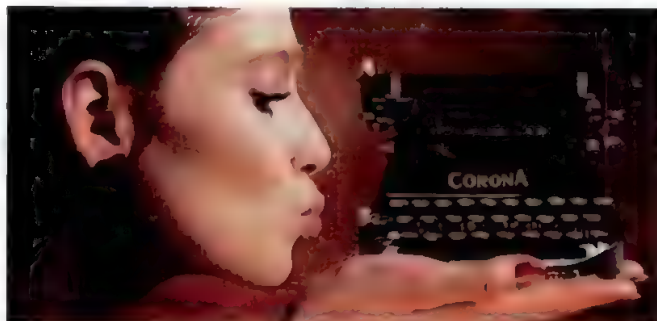
RETURN

“Our ROI is higher with PC Magazine Marketplace advertising.”

— Kelly Leopard
Principal
Total Recall, Inc.

PUT YOUR AD HERE AND WRITE YOUR OWN PC
MAGAZINE SUCCESS STORY. START ADVERTISING
NOW! CALL 800-825-4237 TODAY!

Kiss Your Typewriter Goodbye! Say Hello To Syncware Fill!



**Typewriter Companies Won't Like This.
But You Will.**

SYNCWARE™
A Software Corporation

3025 S. Parker Road, Suite 109
Aurora, Colorado 80014
303.369.6900 FAX 303.369.6540
1.800.308.3690 Support Hotline

The
software
for
pre-printed
forms.



To Order, ask your favorite retailer or call us direct at: **1-800-269-2589** and get
SYNCWARE FILL for \$89.95, plus shipping and handling-price subject to change without notice.
Offer Good In USA and Canada only

Now Shipping

SYNCWARE FILL for Windows™ allows you to fill in pre-printed forms quickly and easily. Simply import any form-image from a scanner, fax file or any of your favorite Windows applications and “type” in the blanks, just as you would with a typewriter.

But, unlike with a typewriter, there's:

- No more measuring.
- No more correction fluid.
- No more hassle.

Only professional looking forms!

Creating templates, you can complete recurring forms from databases, mailing list or spreadsheets. Integrate data from other OLE compliant Windows applications, since SYNCWARE FILL supports OLE version 2.0.

Even more, SYNCWARE FILL gives your office the same power as a major corporation because FILL incorporates ODBC 2.0, allowing you to perform both data entry and form filling functions with your databases.

Because of its many features, SYNCWARE FILL is the most powerful forms product on the market today.

Fill it out, Fill it in, and Fill'er up with SYNCWARE FILL. The software for pre-printed forms.

Syncware Fill recommended system requirements:

486 PC compatible or better.

8MB of RAM.

2 MB available hard disk space.

Windows 3.1 or better.

© Syncware Corporation 1995 All Rights Reserved
Syncware is a trademark of Syncware Corporation.
Windows is a trademark of Microsoft Corporation



CIRCLE 783 ON READER SERVICE CARD

BBS Software for DOS and OS/2!

With PCBoard you can go online without going broke!
You get all of the following for one low price.

PCBoard Bulletin Board Software
Internet EMail and Usenet News Gateway
PCBoard Programming Language Compiler
dBASEIII+ File Access (database & index files)
Local/LAN and Remote/Modem Access
Fido Technology Mailer & Tosser
PCBMail for Microsoft Windows
Credit Accounting System
System management programs & utilities
Free software upgrades for a full year
Unlimited voice technical support for a full year



Find out why PCBoard is the #1 BBS Software WorldWide!

Try PCBoard for yourself!
call our BBS at 801.261.8976
or Telnet to 199.67.41.2

Call Now 800.356.1686

PCBoard.

Clark Development Company, Inc.

1950 South 700 East, Suite 303 Murray, UT 84107 7173
Tel 801 261 1646 • Fax 801 261 8967 • BBS 801 261 8976
E-Mail: sales@saltax.com • tech.support@saltax.com

CIRCLE 785 ON READER SERVICE CARD

Invisible Files



The New Way To Hide Information

Transforms your files into non-printable characters giving the illusion of empty files. Your files will therefore, look null and invisible. If given a password, which is optional, your files will automatically be encrypted before becoming invisible. The program also features programmable functions to handle most difficult situations. Invisible Files automatically become Read-Only. For Windows and DOS
Overseas orders: Add \$3.00

Mysterious & Mythical



Black Star International, Inc.

2124 16th Ave.
Sacramento, Ca 95822

\$23.00

(916) 737-0703

CIRCLE 788 ON READER SERVICE CARD

BUSINESS ESSENTIALS

Money Back Guarantee! **get it done right!**

"Sets new standards for its genre...no other business-plan software can match it!"

—PC Magazine, February 7, 1995



- Business Plan Pro
- Marketing Plan Pro
- DecisionMaker



1-800-229-7526
Fax (503) 683-6250

Palo Alto Software

144 E. 14th Ave., Eugene, OR 97401

pasware@aol.com

http://www.pasware.com

CIRCLE 786 ON READER SERVICE CARD

SALES

"PC Magazine Premier advertising works for us. We're advertising to sell off the page. In Premier that's what our ad does!"



—Mike McCoy
President
Advanced Digital Systems

PUT YOUR AD HERE AND WRITE YOUR OWN PC
MAGAZINE SUCCESS STORY. START ADVERTISING
NOW! CALL 800-825-4237 TODAY!

FIND ANYONE, ANYWHERE, INSTANTLY

Designed for



Microsoft®
Windows 95



"Easily the
Best CD-ROM
Phone Directory
you can buy!"

—PC World, December 1994

PHONEDISC '95 - The Phone Directory Solution on CD-ROM!

PhoneDisc '95 delivers exactly what you need to boost sales, increase productivity, expand your customer base, or just find an old friend. PhoneDisc's 90 million listings cover virtually all of the nation's 5,600 phone books, ranging from Manhattan to Monroeville, from Chicago to Chattanooga, from Los Angeles to Luray!



Best Business Product
1994
CD-ROM Home & Office World Expo
August 1994

- **NEW!** Unprecedented accuracy (93% on average)!
- **NEW!** ZIP Code + 4 information for 4 out of 5 listings!
- **NEW!** Unlimited downloading of all listings!
- **EXTENSIVE COVERAGE!** Of some of the most remote areas nationwide!
- **EXCLUSIVE!** Blazingly fast search software that scrolls through the listings as you type!



Best CD-ROM Reference Product
Home Office Computing
December 1994



Top 100 CD-ROMs
PC Magazine
September 1994



Top 5 Business CD-ROMs
PC Computing
November 1993

DIGITAL DIRECTORY ASSISTANCE, INC. • 6931 Arlington Rd # 405, Bethesda, MD 20814

PhoneDisc '95 is updated quarterly, so listings are always current and complete -- and the sheer number of listings dwarfs all other CD-ROM directories. Independent studies have proven PhoneDisc to be the best in accuracy, speed, coverage, and search software. Try PhoneDisc '95 today, and get the next edition absolutely FREE!

\$79 BUSINESS '95

9.5 million listings with reverse searching by name, address, phone number, business type or SIC code.

\$69 RESIDENTIAL '95

Lists 80 million residences on 2 regional discs! Retrieves names, phone numbers, addresses and ZIP codes.

\$199 POWERFINDER '95

90 million residential & business listings on 5 regional discs with reverse search indexing.

\$99 COMBO PACK '95

PhoneDisc Business & Residential directories bundled together. 2 great products, 1 great price!

\$299 POWERFINDER PLUS '95

NEW! PhoneDisc '95 PowerFinder, Residential & Business in one package. The ultimate utility for power users!

Call and Order Today! **1-800-284-8353** PhoneDisc

CIRCLE 787 ON READER SERVICE CARD

FAST TRACK for Novell's CNE Certification

ONLY \$595 plus \$20 shipping & handling

Featuring the best-selling **Novell's CNE Study Guide** plus the complete **So You Wanna Be a CNE?!** video series

Test Master ASSESSMENT SOFTWARE INCLUDED

Conforms to Novell's NEW CNE PROGRAM announced April 11, 1995

COURSES COVERED

- NetWare 3.1x Administration
- NetWare 3.1x Advanced Administration
- NetWare 3.1x Installation & Configuration
- NetWare 4 Update
- Service and Support
- Networking Technologies
- TCP/IP

United Education Centers
50 South Main, Pleasant Grove, UT 84062
801-785-7900 ext. 22

CALL 1-800-877-4889 ext. 22

CIRCLE 789 ON READER SERVICE CARD

Make no mistake about it!

The most fully-featured, automated data entry software is now the most accurate.

TELEFORM™ 4 WITH TRI-CR.

The technology behind our latest success story is Tri-CR. Our new powerful character recognition software provides you with even greater accuracy.

AUTOMATED DATA ENTRY.

ACCURACY FROM A TO Z.

Whether your forms contain hand print or machine print text, you're assured the highest level of accuracy available. What's more, it's affordable too. Teleform 4 with our new cutting-edge technology is just \$1495. Call **800-659-8755** today to order or for more information.

SEE US AT
SHOWS WHERE WE'LL BE
CHECKING YOU OUT

TELEFORM 4 PROCESSES:
REGISTRATION FORMS
SALES ORDERS, TIME CARDS, CLAIMS
SURVEYS AND MORE

READS MACHINE PRINT TEXT (OCR)
READS HAND PRINT TEXT (ICR)
READS OPTICAL MARK RECOGNITION ENTRIES (OMR)
READS BARCODES

Cardiff Software
PHONE 800-659-8755 FAX 610-941-4551

CIRCLE 791 ON READER SERVICE CARD

Video Training for Windows Applications

Rob Aronson
NetWare 4.1 Instructor & Novell CNE & ECNE

Dave Bellamy
MS Excel Specialist & MS Excel/Project Instructor

Alison Butler
MS Certified Developer & Access 2.0 Instructor

Chris Melo
Lotus Notes Certified Trainer & Lotus Notes Instructor

Special MS Office 4.x Video Combinations

MS Office 4.x Standard (15 videos/17 hours)\$349.95 (with KeyNotes \$489.95)

MS Office 4.x Pro (13 videos/14 hours)\$495.95 (with KeyNotes \$639.95)

MS Office 4.x Plus (16 videos/19 hours)\$579.95 (with KeyNotes \$749.95)

Special PerfectOffice 3.0 Video Combinations

Novell PerfectOffice 3.0 Standard (15 videos/17 hours)\$349.95

Novell PerfectOffice 3.0 Pro (13 videos/14 hours)\$495.95

Novell PerfectOffice 3.0 Plus (16 videos/19 hours)\$579.95

Special SmartSuite 3 Video Combinations

Lotus SmartSuite 3 Standard (15 videos/17 hours)\$349.95

Lotus SmartSuite 3 Pro (13 videos/14 hours)\$495.95

Lotus SmartSuite 3 Plus (16 videos/19 hours)\$579.95

KeyNotes Windows 3.1

Beg/Int/Adv (ea) \$49.95
Special-All Three \$129.95

KeyNotes Windows 3.11

Beg/Int/Adv (ea) \$49.95
Special-All Three \$129.95

KeyNotes Windows 3.11

Beg/Int/Adv (ea) \$49.95
Special-All Three \$129.95

KeyNotes Windows 3.11

Beg/Int/Adv (ea) \$49.95
Special-All Three \$129.95

KeyNotes Excel 5.0

Beginning \$49.95
Intermediate \$49.95
Advanced \$49.95
Special-All Three \$129.95

KeyNotes Project 4.0

Level I/II/III/IV (ea) \$79.95
Special-All Three \$239.95

KeyNotes Visual Basic 3.0

Unit 1/2/3 (ea) \$89.95
Unit 4/5/6 (ea) \$89.95
Special-All Three \$249.95
All Six Videos \$448.95

KeyNotes Word 6.0

Beg/Int/Adv (ea) \$49.95
Desktop Publishing \$49.95
Mail Merge/Forms \$49.95
Special-All Three \$149.95

Other Videos

MS BackOffice Call
PageMaker (ea) \$49.95
Harvard Graph (ea) \$49.95
Presentations (ea) \$49.95
Over 150 Titles Available

3 Easy Ways to Order.

CALL 1-800-748-4838
8 0 1 3 7 5 8 6 8 0

FAX 1-801-373-6872

MAIL K.L.S. Corporation
2181 Larsen Parkway
Provo, UT 84606
PCMD895 ADP PM85

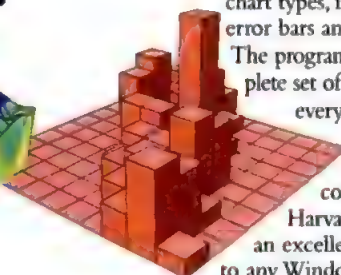
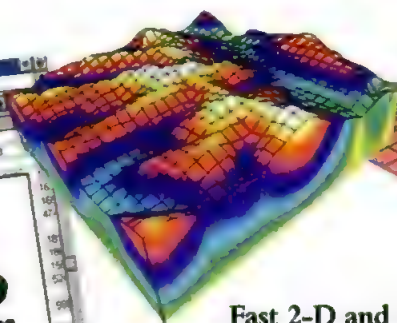
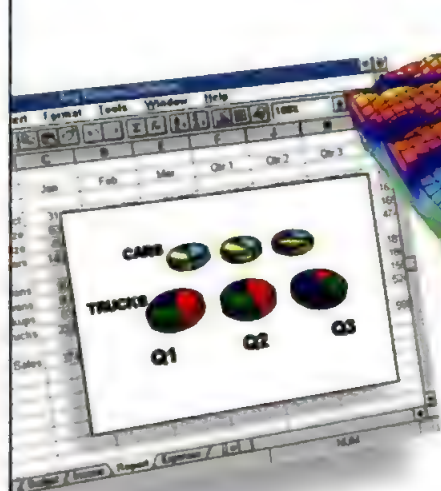
KEYSTONE Learning Systems Corp.

KEYNOTES

30 DAY
Average 2 hours per video

CIRCLE 790 ON READER SERVICE CARD

Visualize your Excel and 1-2-3 data like never before.



Fast 2-D and 3-D charts from any Windows data.

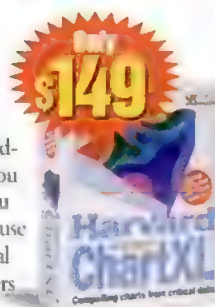
Once again, the makers of award-winning Harvard Graphics bring you the innovative graphics software you really want. This amazingly easy to use charting tool removes the traditional boundaries faced by spreadsheet users

to offer fast, flexible charting and visual analysis of business, statistical and technical information.

Harvard ChartXL™ for Windows offers a dazzling Graph Gallery of 183 chart types, including bubble plots, error bars and 3-D contour plots.

The program also provides a complete set of customization tools for every aspect of your graphs.

Certified by Microsoft as "Office compatible", new Harvard ChartXL is an excellent complement to any Windows package.



For more information, or to order,

**Call
1-800-336-8360
Oper. 438**



©1995 Software Publishing Corporation. All rights reserved. Harvard, Harvard Graphics and the Software Publishing Corporation name and logo are registered trademarks and Harvard ChartXL is a trademark of Software Publishing Corporation. Harvard ChartXL and Harvard Graphics are products of Software Publishing Corporation and have no connection with Harvard University. SPC acknowledges the trademarks, and the rights of trademark owners, referred herein.

CIRCLE 793 ON READER SERVICE CARD

★ LASER INKJET COMPUTER CHECKS ★

CONTINUOUS FEED CHECKS AND CHECK SAVERS ALSO AVAILABLE

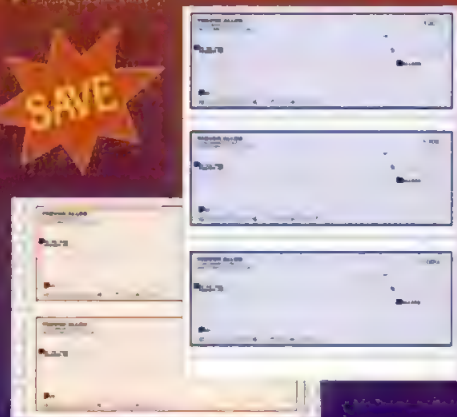
QUICKEN
SIMPLY MONEY
MICROSOFT MONEY
MANY MORE

AS LOW AS \$21.95

CALL:
1-800-239-4087
ext. 51

FAX ORDERS:
1-800-774-1118
(PLEASE FAX COPY OF VOIDED CHECK)

**MC & VISA
ACCEPTED**



Designer
CHECKS
P.O. Box 13367 • Birmingham • AL 35202

Quantity	Price
250	\$ 26.95
500	42.95

P0510195 **Order Form**
TO ORDER CALL 1-800-239-4087

Item Description	Color	Quantity	Starting Check Number*	Price
* If no starting number is indicated, 1001 will be used.				Subtotal
Sales Tax (Alabama residents add 8%)				
All orders ship within 7 working days (Allow time for delivery)				Shipping and Handling
				Order Total

\$5.00

CIRCLE 792 ON READER SERVICE CARD

The Japanese Word Processor for US Windows

KanjiWORD

Version 3.0

漢字ワード

OLE2 compatible!

- Windows 3.1 compatibility.
- 2 TrueType quality, scalable Japanese fonts for a clean printout at any point size.
- Insert Japanese from KanjiWORD into your other Windows applications using OLE 2.0 technology.
- User definable kanji registration allows easy lookup for unusual kanji combinations.
- 100 sample Japanese documents.
- 50,000 word English-Japanese dictionary.
- Print to any Windows-compatible printer.
- English and Japanese menus and dialog boxes, manual, and technical support.



Only \$279
KanjiWORD 2.0 Upgrades \$99
Free Demo Available
Call about Educational Discounts
(most quality)

Pacific Software Publishing, Inc.

14405 SE 36th Street #300 Bellevue WA 98006
 Tel (206) 562-1224 Toll Free (800) 232-3989 Fax (206) 562-0811

CIRCLE 704 ON READER SERVICE CARD

Retail Accounting Solution!

PCM 8/95

MicroBiz

The Point-of-Sale solution that gives you more money, more control and more flexibility.

See for yourself how effectively MicroBiz software can manage your retail business

- ✓ Accurate Inventory Control
- ✓ Defined Customer Tracking
- ✓ Complete Invoicing
- ✓ Detailed Receipt Generation
- ✓ Effective Targeted Mailing Lists



MicroBiz Corp. • 300 Corporate Drive • Mahwah, NJ 07430 • Phone: 201-512-0900
 FAX: 201-512-1919 • From the Internet: <http://www.carroll.com/microbiz>
 24 Hr. BBS: (201) 512-0801 (Download a demo today)

FREE Catalog...Call Today! 800-637-8268

CIRCLE 801 ON READER SERVICE CARD

Organize Graphic Images, Audio, Animation, and Digital Video Files



Maché Multimedia Organizing Software for Windows

- Archive Documents
- Create Photo Albums, Family Trees
- Play Movies and Audio Files

79.95

Meets all Multimedia Indexing and Reference Needs!
To Order Call 1-800-762-1983 or FAX 1-405-762-2683

Fax orders include: Name, Address, Phone#, Credit Card Type and Number, and Expiration Date. We accept VISA, M/C, and Money Orders. Add \$5 for shipping, handling, and sales tax where applicable. Dealer Inquiries Welcome.

Pentico, Inc., P.O. Box 2796, Ponca City, OK 74602-2796

CIRCLE 798 ON READER SERVICE CARD

YOUR NEXT STEREO SYSTEM

Radio ROCK II



FM Stereo Digital Tuner

Digitally tuned FM receiver, precise filtering for superb sound quality. 16 presets, Bass, Treble, Balance, Auto Seek, Scan.

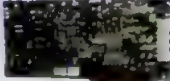
"RBDS" Smart Radio Decodes digital data to show call letters (KTWV), song title, artist name, sports, news, seek by format: Jazz, Rock, Country.

Audio Enhancement SRS® 3-D sound processor, 5 Band Equalizer to optimize audio quality. Enhance sound card sound for outrageous Game Audio.

Radio on Demand "VCR for Radio" Capture songs to hard disk. Create your own listening profile. Custom design your own listening schedule.



For more information or dealer nearest you call
800 888-5244
Sales 310 926-1928
FAX 310 926-0518



CIRCLE 706 ON READER SERVICE CARD

Links Has Fly-bys!



What happens when you combine digital sound, a comic caddy, and aerial fly-bys, with two of the most demanding and majestic courses on the planet?

will thrill you as you soar 50 feet above the fairway, taking in 200 megabytes worth of aerial aesthetics

Tackle the merciless courses of *Runoff Springs* and *Harbour Town* as you wince from the needling of comic caddie Bobcat Goldthwait.

Call 1-800-800-4880 for details

A: LINKS 386 CD

Prepare yourself for the ultimate out-of-PC experience. The magic of multi-media

ACCESS SOFTWARE INCORPORATED



CIRCLE 709 ON READER SERVICE CARD

The Easy Way to Manage Schedules, Attendance and Profiles.

With PeopleScheduler® Plus for Windows,*
you'll say goodbye to scheduling problems!



SAVE 75% or more of your scheduling time. . . Click-n-drag your way to great schedules with the patent-pending TimeVisualizer®, and get automatic conflict checking and break scheduling. Coaches walk you through scheduling tasks. Sure beats paper and pencil, or spreadsheets!

PRODUCE professional schedules and reports in minutes. . . 17 built-in reports make you look good. Graphical and tabular schedules, time and attendance reports, and more are just a few clicks away. Exports data so you can make custom reports as well.

CUSTOMIZE with your own terminology and codes. . . schedule people, places or things with ease. You can schedule people by availability or any criteria you choose.

"PeopleScheduler Plus is a winner..."
— Ricardo Dobson
PC Magazine, 5/16/95

Only **\$149** (MSRP)
For more information
call 1-800-598-1222

Available at these and other fine resellers:

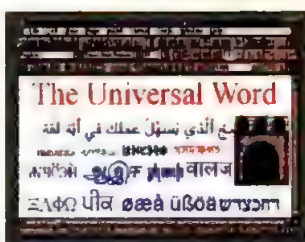
Computer City • Egghead • Fry's • Office Max • PC Zone • Software Spectrum

© Adapt Software Corporation, 1995. All rights reserved. Windows is a trademark of Microsoft Corporation.

CIRCLE 500 ON READER SERVICE CARD

The Giant Killer

Universal Word® modern day DAVID,
VS. Microsoft Word®, Goliath



Ease of Use.
Superior Performance.
Industry Rocking Price,
\$00

2,000 free English copies!
Reserve your copy today!

Advanced Text Formatting. Drag and Drop. Style. Image processing. Mailmerge. Labels. Table of Contents. Footnote. Statistics. Borders. Ranges and Many other features.

Universal Word® Multilingual version The best word processor ever created. It supports over 100 languages: All European languages, Arabic, Armenian, Bengali, Bulgarian, Chinese, Croatian, Farsi, Greek, Gujarati, Hebrew, Hindi, Urdu, Thai, Japanese, Khmer, Lao, Malay, Nepali, Pashto, Punjabi, Russian, Sanskrit, Serbian, Tamil, Tibetan, Transliteration, Vietnamese, etc...
All of this starting at the outrageous price of \$49 Over 21 different spell checkers and thesauruses are available.

Universal Word® is offered with a complete money back guarantee*.

CALL: (800) 4UW-WORD
(800) 489-9673

In U.K. Call 44-1344-303800
Fax: 44-1344-303801

Bill, eat your heart out!

Internet users: Point your browser at World Wide Web address:

http://www.wysiwyg.com

WYSIWYG Corporation

1900 S. Sepulveda Blvd. Suite 208
Los Angeles, CA 90025

Tel: (310) 575-1991 Fax: (310) 575-3141

*Shipping is not included. Products and company names are trademarks for their respective

CIRCLE 503 ON READER SERVICE CARD



TECHNICAL GRAPHICS • DATA ANALYSIS •
DATA ACQUISITION • WINDOWS

ORIGIN is your complete laboratory data management solution, providing unrivaled flexibility, publication-quality technical graphing, and sophisticated data analysis capabilities in an easy-to-use Windows environment.

For a Free Demo, Call
1-800-969-7720

MicroCal Software, Inc. One Roundhouse Plaza Northampton, MA 01060
Tel: 413-585-2033 • Fax: 413-585-1226

CIRCLE 797 ON READER SERVICE CARD

INTERNET FREE

The world's premier internet system is now online, offering you access to computers around the world.

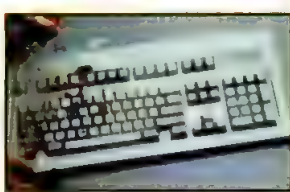


1-515-945-7000

VIZIFLEX SEELS...

**YOUR NO. 1 SOURCE FOR COMPUTER
PROTECTION AND ERGONOMIC ACCESSORIES.**

- Viziflex Seels eliminates the problem of dirt, spills and other contaminants on your computer keyboard. Over 3,000 configurations available.
- Need a customized cover? Viziflex can make 'em.



Contact us for a **FREE** catalog packed with many unique computer accessories. And also receive **OUR SPECIAL FREE OFFER.**

VIZIFLEX SEELS, INC.

16 E. Lafayette Ave. Hackensack, N.J. 07601 (201) 487-6060 Fax: (201) 487-6637

CIRCLE 802 ON READER SERVICE CARD

RETURN

“Our ROI is higher with PC Magazine Marketplace advertising.”

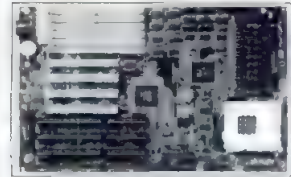


— Kelly Leopard
Principal
Total Recall, Inc.

PUT YOUR AD HERE AND WRITE YOUR OWN PC
MAGAZINE SUCCESS STORY. START ADVERTISING
NOW! **CALL 800-825-4237 TODAY!**

THE FINEST PC CIRCUIT BOARDS!!!!

HSB Computer Laboratories, since 1986 one of the industry's most respected circuit board manufacturers, offers TRUE factory-direct wholesale pricing and unmatched technical support. Just a few product samples include:



- HSB 80486/P24T PCI or VL-BUS MB w/256KCC - Up to 133MHz CPU.....SCALL
- HSB Dual Pentium PCI MB w/512KCC Dual P54C CPU's - Up to 133MHz.....SCALL
- HSB 64-Bit PCI or VL-BUS video card w/1, 2 or 4Mega DRAM/VRAM.....SCALL
- INTEL Pentium PCI MB w/256KCC Triton chipset - Up to 133MHz CPU.....SCALL

Please call for up to the minute pricing...

We accept major credit cards and COD's. Please call for a free wholesale product guide and catalog. All HSB circuit boards feature a 60-day money-back guarantee, and a full 3 year warranty. All SIMM's and CPU's are warranted for life. We positively guarantee our circuit boards to be the fastest available.

HSB
COMPUTER
LABORATORIES

(800) 497-0401

- Distributors
- Manufacturers
- Wholesalers

(Tech Direct) 216-498-0362 [Fax] 216-498-1374, 34208 Aurora Road #297, Cleveland OH 44130

CIRCLE 631 ON READER SERVICE CARD

MEDIA & DRIVES

RECORDABLE CD BLANKS

74 Minute **\$7.99** 4X Certified

OPTICAL CARTRIDGES

128mb '16 230mb '20 650mb '45 1.3gb '53

SYQUEST CARTRIDGES

44mb '33 88mb '37 105mb '50 200mb '70 270mb '56

TAPE CARTRIDGES

ATDK 2120 QIC 80 **\$9.89**

Guaranteed Lowest Prices on 4mm 8mm & QIC Tapes Call



RECORDABLE CD DRIVES

YAMAHA 4X **\$3195** **PINNACLE** 2X **\$1595**
Enhanced Enhanced
w/GEAR Software for Windows RCD-1000 for Windows

HARD DRIVES

Quantum WD
Seagate Master
Fujitsu Corner
IBM Micropulse

REMOVABLE HARD DRIVES

ionega ZIP **\$199** **ionega** 1GB Removable
Only \$14.99 for each 100mb drive Call for Pricing

IF YOU DON'T SEE IT HERE, CALL

MEDIASTORE
Serving America's Data Storage Needs For Less

800-555-5551

CIRCLE 554 ON READER SERVICE CARD

The HARD DRIVE WAREHOUSE

1-800-238-4453

425MB
Conner 420A IDE \$189
Quantum 425S SCSI \$185
Quantum 420A IDE \$189
Seagate 3461A IDE \$189
WD 2420 IDE \$189

540MB
Maxtor 540A IDE \$245
Maxtor 540S SCSI \$249
Micropolis 210S SCSI \$205
Quantum 540A IDE \$219
Quantum 5053L SCSI \$219
Seagate 5660A IDE \$209
Seagate 5660N SCSI \$229
WD 2840 IDE \$199
Conner 540A IDE \$175
Conner 540S SCSI \$249

730MB
Quantum 730S SCSI \$289
Quantum 730A IDE \$249
WD 2700 IDE \$239

850MB
Maxtor 7850AV IDE \$225
Seagate 5960 IDE \$245

1.0 GB
Conner 1000S SCSI \$289
Fujitsu M1000 SCSI \$455
Micropolis 4110 SCSI \$559

1.0GB
Seagate 11230N SCSI \$459
Seagate 11230A IDE \$335
WD 31000 IDE \$339
HP 3323A SCSI \$429
Quantum 31690S SCSI \$395
Quantum 31690A IDE \$339
Quantum EMP1060 SCSI \$429

1.2GB
Maxtor 71260S IDE \$299
Conner 1275A IDE \$319
WD 31200A IDE \$339

1.7GB
Micropolis 2217 SCSI \$539
Micropolis 2217A IDE \$559
Micropolis 2217AV SCSI \$775

2.0GB
Conner 2105S SCSI \$769
HP 2235A SCSI \$765
Quantum 2100S SCSI \$769
Quantum XP32150 SCSI \$765
Seagate 32430N SCSI \$799
Seagate 32430W SCSI \$839
Micropolis 4221 SCSI \$919
Micropolis 3221 SCSI \$765

3.0GB
DEC 5300S SCSI \$749
Micropolis 1936 SCSI \$769
Micropolis 1936AV SCSI \$799

4.0GB
Micropolis 3243 SCSI \$1099
Conner 4207S SCSI \$1049
Quantum 34301GP SCSI \$1049
Seagate 18230N SCSI \$1099
Seagate 18150N SCSI \$1259

9.0GB
Micropolis 1991 SCSI \$1959
Seagate 410800N SCSI \$2459

TAPE DRIVES
280MB WangDut/Archive \$399
825MB WangDut/Archive \$495
2.0GB WangDut/Archive \$749
4.0GB WangDut/Archive \$949
8.0GB WangDut/Archive \$949

SCSI Controllers
SUNJAK THD/2FD/IDE&IO ISA \$85
SUNJAK THD/2FD/IDE&IO PCI \$125
SUNJAK PCI \$95

WIDE SCSI DRIVES
1.0GB Seagate 31230W WSCSI \$899
1.0GB Fujitsu 2694E04 WSCSI \$899
2.0GB Seagate 32430W WSCSI \$899
2.0GB Seagate 32560W WSCSI \$899
2.0GB Fujitsu 29150AU WSCSI \$899
4.0GB Seagate 18230W WSCSI \$1199
9.0GB Seagate 410800W WSCSI \$2699

1.2GB
Maxtor 71260
\$299
3.0GB
Micropolis 1936AV
\$799
Super High-Capacity Expert!

• 30 day money back guarantee
• 5-year original factory warranty
• No surcharge for credit cards
• Please add \$5.9 for external drives
• Prices are subject to change without notice
BASON Call: (818)727-9054 • Fax: (818)727-9064
20130 Plummer St. Chatsworth, CA 91311

CIRCLE 551 ON READER SERVICE CARD

IDE Hard Drive		IDE Hard Drive		IDE Hard Drive		Floppy Drives		FLOPPY DRIVES																
540 MB...\$199	420 MB...\$180	1 GB...\$420	1.44 MB...\$24	1.2 MB...\$25	1.2 MB/1.44 (return) \$20	SALE	REPAIR	1.2 MB/1.44 (return) \$20	SALE															
HARDWARE SALE MFM Hard Drives ST 225 - 20MB MFM - 5.25 HH...\$45 ST 125 - 20MB MFM - 3.5 HH...\$75 ST 251 - 1.40MB MFM - 5.25 FHS89 ST 4096 - 80MB MFM - 5.25 FHS125 HH1090 - 90MB MFM - 5.25 HH\$110 MS6085 - 80MB MFM - 5.25 HH\$110 XT2190 - 170MB MFM - 5.25 FHS229 XT1085 - 71MB MFM - 5.25 FHS250					IDE Hard Drives WD93044 - 40MB IDE - 39 MS...\$65 CP3000 - 40 MB IDE - 28 MS...\$69 ST157A - 40 MB IDE - 28 MS...\$65 ST351A/X - 40 MB IDE - 28 MS...\$79 CFA340A - 340 MS...\$135 CP30174E - 170 MB IDE - 17 MS\$110 CFA850A - 850 MB IDE - 12 MS\$295 2210A - 1.0 GB IDE - 10 MS...\$475 250 MB...\$139					SCSI Hard Drives MIC4110 - 1.0 GB SCSI - 6.5 MS...\$575 1905 - 1.2 GB SCSI - 5.25 FH...\$575 ST4702N - 700 MB - SCSI - 5.25 FH...\$495 ST138N-1 - 38 MB SCSI - 3.5 HH...\$45 ST1102N - 138 MB SCSI - 3.5 HH...\$130 ST157N - 49 MB SCSI - 3.5 HH...\$75					MONTHLY SPECIAL 14" SVGA 28 (new)...\$195 14" SVGA 28 (demo)...\$165 15" SVGA 28 (new)...\$295 17" Flat Digital (New)...\$610 14" Mono VGA (demo)...\$50					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40				
Notebook Hard Drives 800MB SCALL \$410 514MB \$410 340MB \$325 280MB \$295 120MB \$185 80MB \$145 60MB \$90					SCSI Hard Drives 1905 - 1.2 GB SCSI - 5.25 FH...\$575 ST4702N - 700 MB - SCSI - 5.25 FH...\$495 ST138N-1 - 38 MB SCSI - 3.5 HH...\$45 ST1102N - 138 MB SCSI - 3.5 HH...\$130 ST157N - 49 MB SCSI - 3.5 HH...\$75					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40									
FAX Machine Loaded with Features...\$185					MOTHERBOARDS 486DX/66 INTEL/CYRIX...\$255/195 386DX40 with CPU...\$95 PENTIUM 66 with CPU...CALL PENTIUM 90 with CPU...CALL 486 DX4/100 with CPU...CALL					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40									
WE BUY OBSOLETE PRODUCTS working/non-working Hard Drives, Floppy Drives, and old CPU's & Memory					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40														
Special Offer! 39 DP SVGA 1024 X 768 \$145					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40														
Special Offer! 39 DP SVGA 1024 X 768 \$145					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40					REPAIR 360K/720K...\$20 PS/2 1.44MB...\$59 PS/2 720K...\$40														

CIRCLE 553 ON READER SERVICE CARD

BATTERIES

POWER EXPRESS

- Increase Your Battery life!
- Over 3,000 Laptop Batteries
- Cellular and Camcorder too
- Same day Shipping & 1 yr Guarantee
- NiCad and Nickel Metal Hydride

IBM Thinkpad 360/750 Series \$219
Compaq Contura N MH \$119
NEC Versa NiMH \$179
Texas Inst. TM3000/4000 \$82
Toshiba T1000LE/5E/XE \$59
Toshiba T1900-1960 NiMH \$125
Toshiba T4700-4900CT \$125
AST Premium Executive \$74
Universal Laptop Car Cord \$69

800-769-3739

Open 24 hrs/7 days Key: FF121
Call for FREE Battery Guide & Catalog

• A Member of the Data & Communications Group
• Tel: (415) 525-0733 • Fax: (415) 525-0140
• e-mail: PowerExpress@att.net

CIRCLE 555 ON READER SERVICE CARD

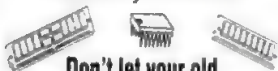
Sales Hotline:
(800) 774-7014
Fax
(714) 832-1962

ACS
Sales • Upgrade • Service
Int'l. Orders - 714/832-1786

WE'LL PAY YOU FOR YOUR OLD MEMORY

1x9, 4x9, 30 Pin, 72 Pin,
Ind. Chips, Mem. Bds., IC Dram Cards

— ANY MEMORY —
All Memory Has Value!



Don't let your old
memory collect dust

Call or fax what you have available

1-800-718-7755

THE MEMORY LIQUIDATORS

"The company that buys memory back"

551 Main St., Ste. 1174, El Segundo, CA 90245-3060

Ph. 310-676-3074 Fax 310-676-3076

CIRCLE 556 ON READER SERVICE CARD

MEMORY IS A TERRIBLE THING TO WASTE DIRECT FROM THE MANUFACTURER YOUR ULTIMATE MEMORY UPGRADE SOLUTION



MEMORY CONVERSION SOLUTION
MEMORY TRADE-UP PROGRAM

Expandable SIMMs
SIMM+ (4MB+, 16MB+)

YOU PROVIDE THE MEMORY,
WE PROVIDE THE FOLLOWING SOLUTIONS
Plug and play Memory Conversion Adapters
SimmSaver/30 converts Four 30-pin
SIMMs into a single 30-pin SIMM
SimmSaver/8 converts Four 30-pin
SIMMs into a single 72-pin SIMM
SimmSaver/82 converts Eight 30-pin
SIMMs into a single 72-pin SIMM
SimmSaver/32 converts Two 72-pin
SIMMs into one 72-pin SIMM

* Patent Pending

SimmSaver 1-800-636-7281

Tel. (316) 264-2244 • Fax: (316) 264-4445
FAX ON DEMAND 24 HOURS
http://WWW.saysan.net/simmSaver/
Email: simmsaver@saysan.net
228 N. Pennsylvania • Wichita, KS 67214

Technology, Inc.

Simply Inventors

of Memory Solutions

CIRCLE 558 ON READER SERVICE CARD

486 NOTEBOOK 4MB 80 MB \$699

TOSHIBA
386SX 2MB-60MB HDD - \$599
286 2MB-PCMCIA - \$299

Tel. 714-975-0552
Fax 714-975-1560

Dollar Computer Corporation
1809 E. Dyer Road, #304
Santa Ana, CA 92705

800-436-0552

CIRCLE 559 ON READER SERVICE CARD

Call for Quantity Discount!

LA
COMPUTER CENTER

(800)689-3933

Phn (310) 473-2535 FAX (310) 312-9041

TOSHIBA



2400CT
8RAM/320HD
SALE \$2099

BRAND NEW "A" STOCK

Protege 610CT 586/90	CALL
2100M	4/260 \$1299
2105CS	4/350 \$1799
2105CT	8/350 \$2399
2150CDS	8/510/CD \$2899
2150CDT	8/510/CD \$3499
2400CS	4/320 \$1899
2400CT	8/250 \$1999
2450CT	8/510 \$3199
3400CT	4/250 \$1699
4850CT	8/510 \$3199
4900CT	8/810 \$4599

FACTORY REFURBISHED

ONE YEAR MANUFACTURER'S WARRANTY	
1910	4/200 \$1099
1910CS	4/200 \$1369
2105CT	8/350 \$1999
4700CT	8/320 \$2399
4800CT	8/510 \$2599
4900CT	8/810 \$3999

**GREAT PRICES ON
MEMORY & MODEMS**

IBM ThinkPad!

350 (SL25mhz)	4/250 \$1099
360CE (50mhz)	4/340 \$2499
360CSE (50mhz)	4/340 \$2099
701C (50mhz)	4/360 \$3999
755CSE (100mhz)	8/340 \$3499
755CD (100mhz)	8/810/CD \$6599

COMPAQ

Aero 4/33C (33mhz)	4/170 \$1299
Elite 4/50CX (50mhz)	4/340 \$2399
Elite 4/75CX (75mhz)	8/510 \$3599
Elite 4/75CXL (10.4"sc) 8/810	\$3999

Prices subject to change without notice.

CIRCLE 557 ON READER SERVICE CARD

1-800-771-4049 GALAXY COMPUTERS, INC.

TECHNICAL SUPPORT	SYSTEMS	TECHNICAL SUPPORT
486SLC-33 TI \$249	1MB RAM with 256K CACHE	Minitower Case \$34
486SX-33 INTEL \$449	500MB HARD DISK DRIVE	Desktop Case \$45
486DX2-66 AMD/INTEL \$499/\$534	1.44MB FLOPPY DRIVE	Mini Tower Case \$54
486DX4-100 AMD/INTEL \$539/\$575	VLB PCI SVGA 1MB/2MB	Fulltower Case \$77
PS-90/100 INTEL \$1119/\$1249	PNH IDE VLB PC 4.0	Cooling Fan for Case \$14
SYSTEMS INCLUDE:	131 KEY ENH. KEYBOARD	
1. MOTHERBOARD w/ CPU	MINITOWER OR DESKTOP	
2. 4MB RAM	FULL TOWER PC	
3. 1.44MB FDD		
4. 2HD/2FD CONTROLLER		
5. 25 PIN I/O PORT		
6. 101 KEY ENH. KEYBOARD		
7. MINITOWER OR DESKTOP		
8. MONITOR (w/ 15" or 17" screen)		
9. POWER SUPPLY		
10. CABLES		
11. SOFTWARE (MS-DOS 5.0)		
12. PERIPHERALS (w/ 15" or 17" screen)		

SYSTEMS	TECHNICAL SUPPORT
486SX/DX-33MHZ INTEL \$85/129	TEAC CDROM Q/S INT \$189
486DX2-66MHZ AMD/INTEL \$129/165	TOSHIBA CDROM Q/S INT \$199
486DX2-80MHZ AMD \$139	NEC/TOSHIBA CDROM Q/S SC50339/359
486DX4-100MHZ AMD/INTEL \$185/259	MPEG \$199
Pentium 60/75MHZ INTEL \$269/349	16-BIT SOUND CARD \$59
Pentium 90/100MHZ INTEL \$479/599	4 WATT SPEAKERS \$19
Math Co 387SX-DX-25/33-40 \$29	19-TITLES CD-PACK \$39
Memory 30-PIN, 1MB/4MB \$39/149	
Memory 72 PIN 4MB 8MB 16MB \$159/309/499	

TECHNICAL SUPPORT	TECHNICAL SUPPORT
Trident 16-bit w/256K/512K 1MB \$249	3.5" 1.44MB FDD Mts/Sony \$31
Trident 9440 32-Bit VLB, w/1MB Up to 2MB \$75	3.5" 1.2MB TEAC \$41
Cirrus Logic 32-Bit VLB, w/1MB Up to 2MB \$79	3.5" 1.44MB TEAC FDD \$34
S3 Chip/Trident 32-Bit PCI, w/1MB \$79/89	TEAC 1.2x1.44MB FDD \$99
16-Bit IDE/IO 2HD/2FD/2S/1P/I/O Port \$119	420/540MB HDD IDE \$169/179
32-Bit VLB 4HD/2FD/2S/1P/I/O Port Enh. \$25	1GB HDD IDE/SCSI \$349/469
Promise Cach. Ctr VLB/PCI up to 16MB \$119/159	1.2GB HDD IDE \$179
	250/420MB Tape Backup \$155/179

TECHNICAL SUPPORT	TECHNICAL SUPPORT
386SX/40 486SLC-33 \$49/115	30-Day Money Back
386DX/486DLG-40 128K \$94/115	1-Year Parts
486SX/DX-33 INTEL \$119/229	Lifetime Labor
486DX2-66 AMD \$228	72-Hour Burn-in Period
486DX2-66 INTEL \$244	Lifetime Tech. Support
486DX2-80AMD \$238	All Major Credit Cards
486DX4-100 AMD/INTEL \$284/358	Shipping & handling
PS-90/75 PCI LB \$394/554	Prices subject to change without notice
PS-90/100 PCI LB \$419/579	Not responsible for "dropship" errors
	International orders

CIRCLE 561 ON READER SERVICE CARD

CD ROM TOWER AND JUKEBOX SERVERS FOR ALL OPERATING SYSTEMS

- Sony-Toshiba-NEC-Plexstor double or quadruple speed drives
- Discport or Discserv CD Rom networking included
- Unlimited user license
- Map CD Rom drives as if they were disk drives
- NLM's run on server but tower can be located anywhere on network
- Complete kit to network your CD Roms

JES HARDWARE SOLUTIONS
"Burner Systems"

**FOR BEST PRICE
CALL (800) 482-1866**

CIRCLE 632 ON READER SERVICE CARD

FTI High Quality & Low Price For Your System & Upgrade Needs

Motherboards For Upgrade:

Pentium/100 OCI w/256K	\$925
Pentium/90 PCI/VESA w/256K	\$695
Pentium/75 PCI w/256K	\$555
Pentium/66 PCI/ISA w/256K	\$465
Pentium/60 VESA w/256K	\$395
486DX4/100 (AMD) w/256K	\$275
486DX2/80 (AMD) w/256K	\$245
486DX2/66 (AMD) w/256K	\$235
486DX2/65 (Cyrilx) w/256K	\$190

Low Price Components:

101 Lite On Keyboard	\$20
Mini Tower Case/200W PS	\$38
3.5" 1.44MB Floppy Drive	\$35
S. Mouse/Mouse Pad	\$12
Audio Mouse/CD Titles	\$25
16-bit Sound Card/Speakers	\$70
Dual Speed CD ROM	\$130
4-speed CD ROM	\$210
Adult CD (Movies/Pictures)	\$10
14.4K Internal Fax/Modem	\$40
Network S/W Installation	Call
Network Cable Installation	Call

Memory Module .. Call	
420MB IDE HD	\$180
560MB IDE HD	\$195
750MB IDE HD	\$250
850MB IDE HD	\$265
1.06GB IDE HD	\$335
1.2GB IDE HD	\$415
32-bit VLB IDE IO	\$20
32-bit VLB SVGA-1M	\$70

Systems Service Contract
Available!! Call for Details
We Sell Complete Systems
To Meet Your Specs

One Year Parts & Labor
Warranty
30 Days Money Back
Major Credit Cards,
PO & COD Accepted

To Order:
800-448-2031

Flash Technology Inc.
55 W Hoover Ave
Mesa, AZ 85210
Tel:(602)464-9272
Fax:(602)464-9866

CIRCLE 563 ON READER SERVICE CARD

CLASSIFIED

WE WILL CUSTOM BUILD ANY SYSTEM



- Complete 486 DX2-60 MHz.
- 428 Meg Hard Drive
- 3.5 & 5.25 disk drives
- 14 inch SVGA .28 Digital Color Monitor
- 2X CD Rom, Sound Card, Speakers
- Accessories: Joystick, Mouse, Keyboard
- DOS 6.22 & Windows
- All for only \$60 a month (lease)

THE ONE TO CALL
FOR ALL YOUR
HARDWARE NEEDS
CUSTOM BUILT SYSTEM WILL
BE SHIPPED
THE NEXT DAY!

CALL NOW 1-800-222-8943

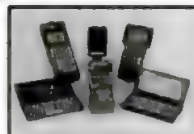
CIRCLE 562 ON READER SERVICE CARD

LOWEST PRICES
TOP NAME BRANDS

Dynasys[®]

LOWEST PRICES IN THE INDUSTRY

CALL FOR FULL
TECHNICAL SUPPORT



HAND - HELDS

Model	Price	Call
Organizer II	\$75	Call
Palm MC100-AL	\$95	Call
Series-3 250K-S	\$95	Call
Person PT2000	\$95	Call

Model	Price	Call
Label Matrix	\$95	\$ 371.25
Power Label	\$95	\$ 746.25
Barney Express	\$95	\$ 386.00

3" CCD SUPER SPECIAL
CCD w WEDGE
\$270



BARCODE SCANNERS

Model	Price	Call
CCS (Hippodamus, Cypres, Wash Affix)		
BGS-5040	\$85	\$ 308.00
BHS-6060	\$85	\$ 397.50
BHS-6090	\$85	\$ 322.50
HLT-1100	\$85	\$ 257.50
HLT-5100	\$85	\$ 322.50
CCD Std Wedge	\$85	\$ 276.00
WA BT3400	\$85	\$ 417.00

Labels (PSC, Spectra Physics, Symbol)

Model	Price	Call
PSC 5310 HP	\$155	\$ 600.00
PSC 5310 HP	\$155	\$ 750.00
BP 400	\$110	\$ 717.00
LS 2000	\$125	\$ 675.00
LS 3000	\$125	\$ 777.00

(All prices include standard cables)



BARCODE PRINTERS

Model	Price	Call
Zebra		
Stripe 9-300	\$285	\$ 1110.00
Stripe 9-300	\$285	\$ 1430.00
170 XL	\$495	Call

Call for pricing on other Zebra products.

Model	Price	Call
Delmida		
Allegro	\$495	\$ 1190.00
Prodigy	\$195	\$ 1750.00
Prodigy Plus	\$495	\$ 1990.00

CodeStar

Model	Price	Call
4102	\$795	Call
5100	\$695	Call

Del Technologies

Model	Price	Call
DP2020	\$495	\$ 675.00
Pinnacle	\$195	Call

Eltron LP-3022-P

Model	Price	Call
Sale 6400	\$85	\$ 990.75
Sale 6400	\$85	\$ 1120.75



PCMCIA BARCODE

Model	Price	Call
Interface Card & SW 490	\$ 399.00	

Type II, Wand and Laser Decoding

PERCON

Model	Price	Call
Interface (Compos, Percon)	\$90	\$150.00

Model	Price	Call
Quicklink	\$95	\$195.00

Model	Price	Call
Series 10 Plus	\$25	Call

Model	Price	Call
Series 30 Plus	\$15	Call

OPTICON COMPSEE SPECIAL

WAND w WEDGE \$220

Fax (813) 443-4390

Dynasys Technologies Inc. 800 Bellair Rd. • Clearwater, Florida 34616 USA

Call (813) 443-6600

Prices subject to change • Call for latest pricing • All product names mentioned herein are trademarks of their respective companies.

CIRCLE 564 ON READER SERVICE CARD

BAR CODE READERS

AMERICAN MICROSYSTEMS

2190 Regal Pkwy. • Euless, Texas 76040 • (817) 571-9015

FOR PC, XT, AT, PS/2 & TERMINALS

- No software changes required
- Data appears as keyboard input
- Reads Code 39, I-2of5, UPC/EAN, Codabar, 11, 93, 128, MSI/Plessey
- Auto-discriminates between codes
- Accepts WAND, SLOT, MAG STRIPE, CCD, LASER
- Easy To Use



BAR CODE PRINTING SOFTWARE

- For Epson, OKI, IBM, Dot Matrix and HP LaserJet Printers
- Prints Code 39, I-2of5, UPC/EAN, Codabar, 128, 93, 11, MSI/Plessey

PORTABLE READERS

- Use as a portable, wedge or terminal
- Input Devices: WAND, CCD, or 5V LASER
- Real-time clock for date and time stamps
- Automatic power off with resume
- "Built-in" Inventory programs
- 54 key alpha/numeric keyboard
- Supports Hayes compatible modems

(800) 648-4452 • FAX: (817) 571-9015
30 Day Money Back Guarantee
One Year Warranty

PC IN A BOX

KS-1 XT CPU card, NEC V40, 1M
Dram, Sram, Flash, Pcmcia, 3 srl,
2 par, modem, A/D. \$129 up

KS-9 AT (F8680) batt. operated CPU
2M Flash, Sram, Pcmcia, CGA
contr., 3 srl, 2 par. \$249 up

PC In-a-Box Complete system with KS-9 CPU,
256K Pscram, 192x128 LCD, 53
kypd, 1 srl, pwr sup, box. \$399

KILA
Call 303-444-7737
Fax 303-786-9983

CIRCLE 630 ON READER SERVICE CARD

RETAIL STORE POINT OF SALE

Need Inventory Control??

For all retail stores. Has quick
invoicing, on line stock search and
browse, sales analysis, stock order
listings, and inventory updating
\$289 - \$489

Cash drawers, tape receipt
printers, barcode scanners
Accts Receivables, Mailing
List program, Barcode
programs, General Ledger,
Accounts Payables

Inventory Programs for labs,
supply rooms, dental offices,
Hospitals, Auto Parts, Tire
Dealers, and wholesalers
Free technical support

800-426-6598
Freeman Software
334 Fieldside • Garland, TX 75043

THE BAR CODE LEADER DOES IT AGAIN

KEYBOARD WEDGE SOLUTIONS!

HAND-HELD LASER
WEDGE COMBO
starting at... \$595

HEWLETT PACKARD
KEYBOARD WEDGE / WAND \$239

800 TECHNICAL SUPPORT
30 DAY MONEY BACK GUARANTEE
SAME DAY SHIPPING
2 YR LASER SCANNER WARRANTY



DATAVISION

Now 3 Locations to Serve You

1-800-486-0620
PHILADELPHIA

1-800-486-9585
SEATTLE

1-800-486-6229
TAMPA

CIRCLE 565 ON READER SERVICE CARD

FOR QUICKER RESPONSE
FAX TO
(609) 829-0692

Free Product
Information

BUSINESS REPLY MAIL

FIRST-CLASS MAIL

PERMIT NO. 433

RIVERTON, NJ

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. BOX 11804
RIVERTON, NJ 08076-9404

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



FREE PRODUCT INFORMATION

It's the quick and easy way to get detailed information mailed directly from the manufacturer, free of charge.

• CIRCLE the numbers that correspond to the item(s) about which you'd like more information.

• CHECK OFF your answers to the questions below.

• FAX your request to (609) 829-0692 or mail this card and we'll pay the postage!

VOID AFTER
12/31/95

001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020 021 022 023 024 025 026 027 028 029 030 031 032 033 034 035 036 037 038 039 040 041 042
043 044 045 046 047 048 049 050 051 052 053 054 055 056 057 058 059 060 061 062 063 064 065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080 081 082 083 084
085 086 087 088 089 090 091 092 093 094 095 096 097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126
127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168
169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210
211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252
253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294
295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336
337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378
379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420
421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462
463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504
505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546
547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588
589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630
631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672
673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714
715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756
757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798
799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819

PRODUCTS FEATURED IN NETWORK SECTION

820 821 822 823 824 825 826 827 828 829 830
831 832 833 834 835 836 837 838 839 840 841
842 843 844 845 846 847 848 849 850 851 852
853 854 855 856 857 858 859 860 861 862 863
864 865 866 867 868 869 870 871 872 873 874
875 876 877 878 879 880 881 882 883 884 885
886 887 888 889 890 891 892 893 894 895 896
897 898 899 900 901 902 903 904 905 906 907
908 909 910 911 912 913 914 915 916 917 918
919 920 921 922 923 924 925 926 927 928 929
930 931 932 933 934 935 936 937 938 939 940
941 942 943 944 945 946 947 948 949 950 951
952 953 954 955 956 957 958 959 960 961 962
963 964 965 966 967 968 969 970 971 972 973
974 975 976 977 978 979 980 981 982 983 984
985 986 987 988 989 990 991 992 993 994 995
996 997 998 999

PC 8/95-5

1. If you would like to receive more information on any of the following products, please check the appropriate boxes:

Computers
01. ☐ Microcomputers
02. ☐ Laptops
03. ☐ Notebooks
04. ☐ Workstations

Servers
05. ☐ File Servers
06. ☐ Print Servers
07. ☐ Application Servers
08. ☐ Communications Servers
09. ☐ Database Server

Peripherals
10. ☐ Laser Printers
11. ☐ Ink Jet Printers

12. ☐ RAID
13. ☐ DAT
14. ☐ Optical
15. ☐ Storage Devices
16. ☐ PCMCIA products
17. ☐ Tape Back-up
18. ☐ UPS
19. ☐ CD-ROM Drive
20. ☐ Multimedia Kits/Cards

Software
21. ☐ Software Suites
22. ☐ Groupware
23. ☐ Graphics Software
24. ☐ Utilities
25. ☐ Communications/E-mail
26. ☐ Database Management
27. ☐ Languages/Development Tools

Networking/Internet-
working

28. ☐ Bridges/Routers/
Gateways
29. ☐ Modems
30. ☐ Remote Access/Node
31. ☐ Wireless
32. ☐ Hubs
33. ☐ Network Operating
Systems

34. ☐ Network Management
35. ☐ Network Security
36. ☐ Ethernet Switches
37. ☐ Network Interface
Cards
38. ☐ Frame Relay
39. ☐ ATM
40. ☐ x.25
41. ☐ FDDI

42. ☐ Video Conferencing
43. ☐ On-Line Services
44. ☐ Telephony

2. Do you work in a
DP/MS dept.?
01. ☐ Yes 02. ☐ No

3. Is your company
a reseller?
01. ☐ Yes 02. ☐ No

4. Number of employees
in your entire company:
01. ☐ 25 or less
02. ☐ 26-99
03. ☐ 100-499
04. ☐ 500-999
05. ☐ 1000 or more

Name

Title

Company Name

Address

City

Telephone

State

Zip

5. ☐ Please send me a one-year (22-issue) subscription to PC Magazine for \$34.97 (U.S. price); all other countries add \$36.00 for additional postage



FREE PRODUCT INFORMATION

It's the quick and easy way to get detailed information mailed directly from the manufacturer, free of charge.

VOID AFTER
12/31/95

- CIRCLE the numbers that correspond to the item(s) about which you'd like more information.
- CHECK OFF your answers to the questions below.
- FAX your request to (800) 829-0692 or mail this card and we'll pay the postage!

001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018 019 020 021 022 023 024 025 026 027 028 029 030 031 032 033 034 035 036 037 038 039 040 041 042
043 044 045 046 047 048 049 050 051 052 053 054 055 056 057 058 059 060 061 062 063 064 065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080 081 082 083 084
085 086 087 088 089 090 091 092 093 094 095 096 097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126
127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168
169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210
211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252
253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294
295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336
337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378
379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420
421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462
463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504
505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546
547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588
589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630
631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672
673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714
715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756
757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798
799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819

PRODUCTS FEATURED IN NETWORK SECTION

820 821 822 823 824 825 826 827 828 829 830
831 832 833 834 835 836 837 838 839 840 841
842 843 844 845 846 847 848 849 850 851 852
853 854 855 856 857 858 859 860 861 862 863
864 865 866 867 868 869 870 871 872 873 874
875 876 877 878 879 880 881 882 883 884 885
886 887 888 889 890 891 892 893 894 895 896
897 898 899 900 901 902 903 904 905 906 907
908 909 910 911 912 913 914 915 916 917 918
919 920 921 922 923 924 925 926 927 928 929
930 931 932 933 934 935 936 937 938 939 940
941 942 943 944 945 946 947 948 949 950 951
952 953 954 955 956 957 958 959 960 961 962
963 964 965 966 967 968 969 970 971 972 973
974 975 976 977 978 979 980 981 982 983 984
985 986 987 988 989 990 991 992 993 994 995
996 997 998 999

PC 8/95-5

1. If you would like to receive more information on any of the following products, please check the appropriate boxes:

Computers
01. ☐ Microcomputers
02. ☐ Laptops
03. ☐ Notebooks
04. ☐ Workstations

Servers
05. ☐ File Servers
06. ☐ Print Servers
07. ☐ Application Servers
08. ☐ Communications Servers
09. ☐ Database Server

Peripherals
10. ☐ Laser Printers
11. ☐ Ink Jet Printers

12. ☐ RAID
13. ☐ DAT
14. ☐ Optical
15. ☐ Storage Devices
16. ☐ PCMCIA products
17. ☐ Tape Back-up
18. ☐ UPS
19. ☐ CD-ROM Drive
20. ☐ Multimedia Kits/Cards

Software
21. ☐ Software Suites
22. ☐ Groupware
23. ☐ Graphics Software
24. ☐ Utilities
25. ☐ Communications/
E-mail
26. ☐ Database Management
27. ☐ Languages/Development
Tools

Networking/Internet-
working
28. ☐ Bridges/Routers/
Gateways
29. ☐ Modems
30. ☐ Remote Access/Node
31. ☐ Wireless
32. ☐ Hubs
33. ☐ Network Operating
Systems
34. ☐ Network Management
35. ☐ Network Security
36. ☐ Ethernet Switches
37. ☐ Network Interface
Cards
38. ☐ Frame Relay
39. ☐ ATM
40. ☐ x.25
41. ☐ FDDI

42. ☐ Video Conferencing
43. ☐ On-Line Services
44. ☐ Telephony

2. Do you work in a
DP/MIS dept.?
01 ☐ Yes 02 ☐ No

3. Is your company
a reseller?
01 ☐ Yes 02 ☐ No

4. Number of employees
in your entire company:
01. ☐ 25 or less
02. ☐ 26-99
03. ☐ 100-499
04. ☐ 500-999
05. ☐ 1000 or more

Name

Title

Telephone

Company Name

Address

City

State

Zip

5. ☐ Please send me a one-year (22-issue) subscription to PC Magazine for \$34.97 (U.S. price); all other countries add \$36.00 for additional postage.

FOR QUICKER RESPONSE

FAX TO
(800) 829-0692

Free Product
Information

BUSINESS REPLY MAIL

FIRST-CLASS MAIL

PERMIT NO. 433

RIVERTON, NJ

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. BOX 11804
RIVERTON, NJ 08076-9404

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BAR CODE EXPERT

HP steel wand with
Keyboard wedge reader

\$219

3" CCD with built-in
Keyboard wedge reader

\$329

Portable data collector

• 128K RAM (expand to 256K)

• Built-in program generator

• Uploads data directly to

your application software

• Can be used as a

fixed reader

\$599

• Keyboard wedge reader for PC/XT/AT, PS/2

MAC, Terminals. No software charge

• Reader with RS-232, RS-485, DTMF output

and multidrop protocol.

• Direct from manufacturer. 30 day money

back guarantee. Please call for free catalog.

• Dealer and distributor's discount available.

800-765-2271

IBS-Intelligent Barcode Systems

16031 Kaplan Ave., City of Industry, CA 91744

Tel. (818) 968-6265 • Fax: (818) 968-5527

The #1 Selling Integrated Bar Coding System!

*Vertical Technologies is the leading provider of proven, standards based,
multi-platform, integrated bar coding solutions.*

SCAN • ONE BASIC SUITE

Everything you need to create, print, read,
& track bar code data. Includes
integrated BAR-ONE, SCAN-ONE,
& TRACK-ONE database.

\$449

SCAN • ONE BASIC KIT

Everything you need to create,
print & read bar code data.
Includes BAR-ONE &
SCAN-ONE.

\$299



BAR • ONE BASIC

Bar code label designing & printing
software

\$99

SCAN • ONE

Serial HP bar code reader & decoding
software

\$219

TRACK • ONE BASIC

Tracking database software

\$199

WEDGE • ONE

Keyboard bar code reader

WAND \$299

CCD \$499

Call your reseller or Vertical Technologies

1-800-477-5589

30-Day Money Back Guarantee.

(801) 576-9700 Fax: (801) 576-5538

Products available in Windows, DOS,
Macintosh, or UNIX. Professional
versions of products available.

BAR CODE SOLUTIONS

Inventory Control • Bill of Materials • Security • Document Tracking • Order Entry • Labor Tracking • Equipment Tracking •
Accounting Management • Tool Tracking • Quality Control • Time and Attendance • Work in Process Tracking

CIRCLE 569 ON READER SERVICE CARD

PORTABLE™ PRODUCTS

YOUR COMPLETE SOURCE FOR BAR CODE AND HANDHELD DATA COLLECTION SYSTEMS

■ BARCODE READERS — Keyboard wedge,
RS-232, PC, Mac, Most data terminal interfaces

■ INPUT DEVICES — Laser, CCD, Wand, Slot,
Magstripe — All available with built-in decoder

■ PORTABLE HANDHELD READERS — DOS &
Windows Application Generators — No
programming experience needed. Develop your
Application in minutes.

■ Printers, Verifiers, Label Software, Labels, Custom
Cases, Custom Software Development, Systems
Integration. Complete Systems.

FREE UNLIMITED 800 TECH SUPPORT

UNCONDITIONAL SATISFACTION GUARANTEE

CALL FOR FREE CATALOG

1-800-849-0958

**PORTABLE™
PRODUCTS**

A Division Of International Systems Group, Inc.
8401 K Mayland Drive • Richmond, VA 23294
Phone: 804-346-0111 • Fax: 804-346-0196

CIRCLE 570 ON READER SERVICE CARD

ITS Bar Code Solutions ITS



Wand, Laser & CCD
Scanners
Magnetic Stripe
Readers
Label Printers & Software
Keyboard & Serial
Decoders
Portable Data Collection
Terminals



**30 Day Money Back Guarantee • Next Day Delivery
Call for Free Application Assistance & Full Line Catalog**

International Technologies and Systems

655 N. Berry Street, Suite K, Brea, CA 92621, (800) 228-9487

9201 Forrest Hill Avenue, Suite 108, Richmond, VA 23235, (800) 826-1688

International Sales Tel: (714) 990-1880 Fax: (714) 990-2503

CIRCLE 566 ON READER SERVICE CARD

BAR CODE LABELING, PRINTING & READERS



**PRINTBAR™
BAR CODE
PRINTING**

BEAR ROCK BAR CODE LABELER™ for Windows

- ▶ Design labels with bar
codes, text & graphics.
- ▶ Choose from over 500
popular label formats,
or design your own.
- ▶ Print all popular bar
code symbologies.

PC World says "...it's easy,
sophisticated labeling..."



CODESCAN 3000™ BAR CODE READER

- ▶ Compatible with PC,
PS/2, Macintosh or
serial terminals.
- ▶ Comes with wand and
5 year decoder warranty
- ▶ Laser gun, CCD, badge
slot, magstripe
options

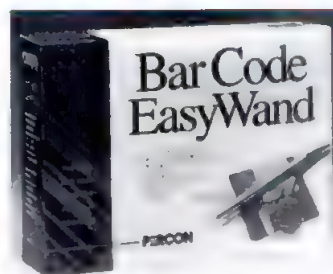
▶ PrintBar.
Precision bar
code fonts for
Windows, OS/2
or Macintosh.
▶ PrintBar II. Bar code
printing program for DOS.

Money Back Guarantee
Refundable Documents

**Bear Rock
TECHNOLOGIES**

4743 Midway Lake Dr. Ste. 100,
Savage Springs, CA 95672

Bar Code Solutions



**PERCON
INCORPORATED**

Bar Code EasyWand™

- Easy and economical way
to add bar code to your
laptop or PC.
- Steel wand connects
directly to your computer's
serial port.
- Scanned data appears as if
it were typed manually.
- Programmable under DOS
and Windows™.
- Perfect turnkey solution for
POS, accounting, and data
entry applications.

For more information or your nearest reseller **1-800-743-6647**

Bar Code Headquarters

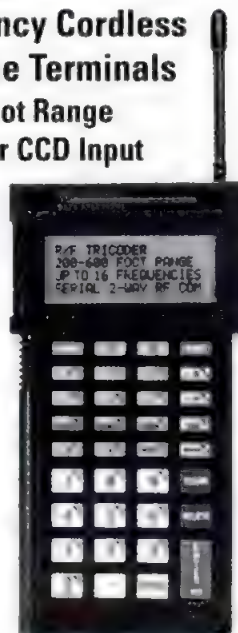
- Portable Barcode Readers
(With Voice Prompts)
64K or 256K RAM



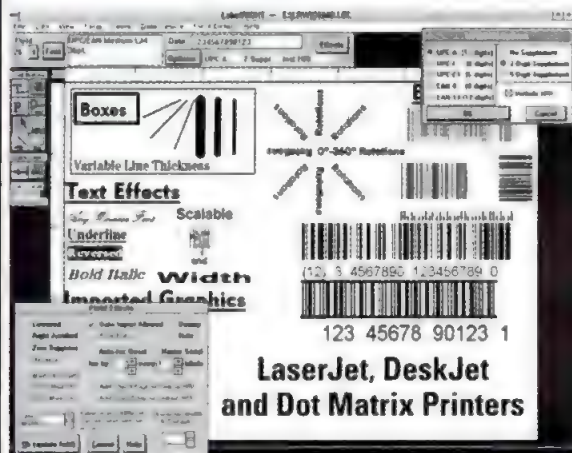
- Bar Code Readers
(Serial and Keyboard)
- Wand, Laser, CCD, Magstripe
or Slot Badge Scanners



- Radio Frequency Cordless
2 Way Bar Code Terminals
150 to 300 foot Range
Wand, Laser or CCD Input



- Bar Code Labeling Software
for DOS or Windows™
- Bar Code Fonts for Windows™

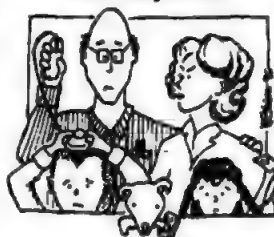


LaserJet, DeskJet
and Dot Matrix Printers

Also Available:

- Thermal Transfer Label Printers
- Bar Code Fonts for Macintosh™
- Laser Scanners • CCD Scanners
- MagStripe Readers
- Slot-Badge Scanners
- Radio Frequency Cordless
Wand Scanners –
No License Needed!

One Family Computer... So Many Mice



Dad has his favorite mouse.
Junior, a trackball. Susie, a
fuzzy wuzzy pointer. Spot, a
chewed up joystick. And mom
has heard just about
enough...

Stop the arguments! With the
WhyMouse™ more than one
device can be hooked up at the
same time. At \$39⁹⁵ it's cheaper
than family counseling.

The **WhyMouse™** Dual Serial
Mouse Adapter instantly switches
between various pointing devices,
like two mice or a mouse and
trackball.

- Automatically gives cursor
command to active device.
- No software needed, just plug it
in.
- Great for: Multi-user computers,
teaching, special pointers,
Gaming; anytime one mouse is
not enough.

For more information or to order
CALL 1-800-628-3185.

P.I. Engineering, Inc.
"The No Slogan Company"
2296 Williamston Rd.
Williamston, MI 48895
517-655-5523
*Shipping and handling extra

Bar Coding for Windows

Code 39 Code 93 Int 2 of 5 PostNet
Code 128 Codabar MSI-Plessey UPC/EAN/ISSN



Postscript/TrueType Fonts
Easy-to-Use
30 Day Guarantee
\$149 each + S&H



Call for FREE information

210.590.9528

fax: 210.656.8993
10902 Forest Smt, San Antonio, TX 78233

riversedge™

CIRCLE 650 ON READER SERVICE CARD

Ordering is Easy!

800-345-4220

Europe Phone: (353) 1 6614 566 • Europe Fax: (353) 1 6614 622 USA Phone: 408-458-9338 • USA Fax: 408-458-9364

- Made in the USA
- "800" Tech Support
- 30 Day Money Back Guarantee
- Qualified P.O.'s Accepted
- 2 Year Warranty on Readers
- Same Day Shipping
- Free UPS Blue in US
- Direct from the Manufacturer

WORTHINGTON
DATA SOLUTIONS

Call for
our Free
Catalog!

The Mail Order Wizard

Everything you need to manage your growing phone-order or mail-order business.

- Order processing
- Inventory control
- Electronic charge processing
- Mail list management
- UPS/USPS manifest
- Financial reporting
- Ad/catalog analysis

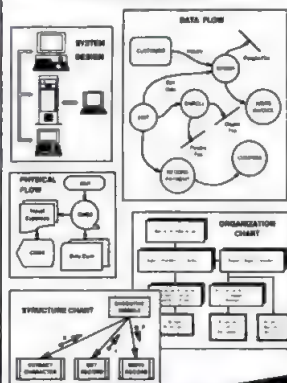
Call 800-676-0098
for free info or
\$20 refundable demo.

The Haven Corporation
1227 Dodge Ave., Suite PMC5
Evanston, IL 60202-1008
708-869-3553

CIRCLE 571 ON READER SERVICE CARD

RFFlow

Professional Flowcharting
For Microsoft® Windows®



Create professional, fine quality charts quickly and easily. Call for free trial disk:
(970) 563-5767 FAX (970) 669-4889
RFF ELECTRONICS
1053 Benjamin Court, Loveland, CO 80538
(\$12990)

CIRCLE 575 ON READER SERVICE CARD

B.S. & M.S. In Computer Science

Get the opportunity and earning power a college degree confers—without leaving home and without spending thousands of dollars.

- ALL COURSES HOME STUDY
- Approved for tuition reimbursement by leading corporations
- Increase your earning power
- Join students from leading computer companies
- Using Windows, C++ and Ada courses available
- CareerPath training in computer programming available

**AMERICAN INSTITUTE
COMPUTER SCIENCES**

For free information
call 1-800-767-AICS

ACCREDITED MEMBER
World Association of
Laboratories and Colleges

CIRCLE 576 ON READER SERVICE CARD

IMAGERS®

Digital Output & Production Center
Overnight Services

Best Value!
\$3.00
Slides Only
Quality Guaranteed



Indigo On-Demand Printing
4-Color Digital Offset Press

Slides & Continuous
Color Digital Printing
4-Color Printing
Multi-Color Services

Photo CD
Pro/\$8 • 35mm Format/\$.90

Satisfaction Always Guaranteed

CIRCLE 578 ON READER SERVICE CARD

Voice Mail Cash Machine



Make thousands of dollars effortlessly by installing our voicemail in your 286/386. Use to answer your home office phone, rent pocket-pagers, advertise products or operate a pay-per-call service using credit cards, passwords or a 900#.

Call 24 hours: 800.283.4759
Int'l & Demo line: 818.718.9560

DemoSource™
The Voice Applications Software
8345 Reseda Blvd. Ste 202
Northridge, CA 91324 USA

CIRCLE 572 ON READER SERVICE CARD

CELLULAR SOFTWARE

WE HAVE IT ALL!

- Supports over 20 popular phones
- All Motorolas over 9122
- Test Modes/ ESN Emulation

ESN READER.....\$400
G2/AMP Sync lock.....\$600

We are offering a new 8.6 MB cellular package that includes book and software for the most popular phones that lets you clone several phones to one existing account. It's legal, too! Use your phone as a scanner. Software contains many utilities and peripheral programs for the astute user. Call for details.

CELLULAR MASTERS
4045 S. SAVIERS RD., OXNARD, CA 93033
(805) 486-0867

CIRCLE 574 ON READER SERVICE CARD

Home Study ACCREDITED B.S. DEGREE In Computer Science

Easy-to-study lessons in Multimedia, C, C++, Visual Basic, Assembly Language, Unix, Database Design, Cobol, Ada, Pascal, & many more lead to the only home-study BSCS degree accredited by an agency recognized by the U.S. Department of Education.

Professional software & hardware provided at no extra charge. Programs in Computer & Electronics Engineering Technology as well. Over 44 years experience. Accredited by the Distance Education and Training Council.

Free Catalog: 1 (800) 955-2527

GRANTHAM
College of Engineering
Grantham College Rd., Slidell, LA 70469-5700

CIRCLE 579 ON READER SERVICE CARD

WE PRINT BIG COLOR POSTERS

FROM COMPUTER FILES
PHOTOGRAPHS - DRAWINGS
Big Color Postscript Prints

- Backlit Displays
- Trade Show Displays
- Signs
- Product Promotion

Fast
SIZES TO 36"X 96"

800-860-4950
Creative Electronic Arts
2400 W. 11th St. Ste 207
PO Box 11183 Fort Wayne IN 46856

Chicago - Clearwater - New York

CIRCLE 578 ON READER SERVICE CARD

America's most popular, most complete, and most affordable solution for the mail order business—order entry/review, credit card processing with draft capture, UPS manifesting, profit analysis, accounting, telemarketing, list management, Clipper compiled, dBase III+ files. Single and Multi-user versions. Find out why more people buy MOM after comparing! Demo kit \$25 refundable deposit.

MailOrderManager™

Dydacomp Development Corporation
150 River Road, Suite N1, Dept. PCM
Montville, NJ 07045

1-800-858-DMOM
201.335.1256



CIRCLE 573 ON READER SERVICE CARD

F.R.E.E.

Voice Processing Software

That's right! Just buy a Rhetorex 4 line voice card (\$995) and receive a complete LaserVoice working demo absolutely free. With manual. Demo actually answers calls. Includes software for telemarketing, talking classifieds, fax on demand, auto-attend, voice-mail, and more.

Upgrade to full version for only \$995. All Rhetorex boards come with a 3 year warranty.

Other software available:

- ZipFinder: Finds business location by zipcode
- CallNet: Toll free calling network

ORDER TODAY!
216-253-8787
FREE TECHNICAL SUPPORT
Ameritax 572 W. Market St. #5, Akron, Ohio

CIRCLE 576 ON READER SERVICE CARD

learn Spanish IN 6 WEEKS

with Power Spanish Ver 1.0 an interactive multimedia learning system for Windows-based PCs

- INCLUDES:
- Extensive interactive drills, exercises, and games
 - Full animation, extensive audio clips of native Spanish speakers plus videos
 - Advanced audio processing utilities



FOR MORE INFORMATION, CALL
1-800-538-8867
BoyWare, Inc. Tel: (416) 260-4492

CIRCLE 577 ON READER SERVICE CARD

3DSTUDIO SURFCAM

**FEAR NO
HARDWARE
LOCK**

Lock Removal Experts
IMAGINE THAT
One Evergreen Drive
Seaville, NJ 08230
609-390-2799/3750 fax
CIRCLE 581 ON READER SERVICE CARD

Increase Your Sales 100%

It's a proven fact – dependable, effective copy protection increases your software revenue by a *huge* percentage. Copy protection is a business investment that always pays off. From our premium Hardlock™ system to our cost-effective Hardlock LT™, Glenco offers a complete range of copy protection products for your software.

And because Hardlock products are the highest quality in the industry, we can back them up with a **FULL 3-YEAR WARRANTY**.



Choose Hardlock LT for your high volume, lower priced software. LT features the same ASIC security as other keys on the market, but at a much lower price.



Choose Hardlock for ultimate protection against hackers, key emulators and more! Hardlock's custom programmable variable response algorithm and extra security modules make this the most secure, technologically advanced protection of its kind.

With Glenco products, you can even choose your favorite method of implementation: Programmer's API, Pre-Defined Templates, or Quick & Easy Automatic Implementation with HL-Crypt.

All of our products are manufactured and fully supported at our Illinois facility.

Call now for a \$14.95 evaluation kit.

1-800-562-2543

GLENCO
ENGINEERING INC.
SERVING THE SOFTWARE INDUSTRY SINCE 1979
Software Protection • Data Security

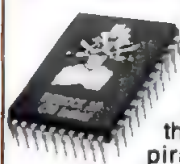
Any way you choose, Glenco is the right choice!



Call 708-808-0300 or Fax 708-808-0313 for a distributor in your country.
©1995 Glenco Engineering, Inc.

CIRCLE 582 ON READER SERVICE CARD

Leaders In Software Security



Since 1986, Az-Tech Software has been providing the most secure software and hardware based copy protection systems available. Thousands of developers have chosen **EVERLOCK** and **EVERKEY II** as their weapons in the fight against software piracy. Why? Because our products offer you the ultimate in security, compatibility, ease of use and transparency at affordable prices.

Features include: Encryption • Serialization • Remote Reset • User Data & Access Flags • Date & Execution Limits • and much more!

Call today and ask about our low cost Trial Kits. A free demo is also available.

(800) 227-0644



Az-Tech Software, Inc. - Leaders In Software Security
201 East Franklin Street, Suite 11, Richmond, MO 64085-1883
(800) 227-0644 • (816) 776-2700 • FAX (816) 776-8398



**CRYPTKEY SOFTWARE
LICENSING SYSTEM**

"Software copy protection with no hardware or disk key"

- CryptKey is software copy protection that is
- completely secure from any diskcopy program
- completely compatible with MS-DOS, MS WINDOWS, WIN95, WIN NT
- customer friendly - no disk or hardware key, less support calls, instant disaster recovery
- compatible with CD-ROM, BBS, Internet

CryptKey can increase your software sales by allowing you to sell your program

- by increments - sell add-on software options
- by runs - e.g. sell 100 calculations for \$100.00
- by time - e.g. lease your program for 60 days.

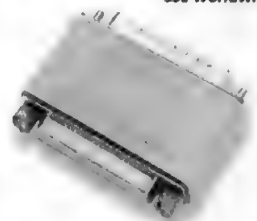
CryptKey uses a numeric key that can be transmitted by phone, fax, or email. Sell your customers more options, more copies, more time or more runs instantly, just by making a telephone call (great for overseas customers). CryptKey is produced by Kenonic Controls Ltd., engineering and software since 1972.

Kenonic Controls Ltd.
7175 - 12th Street S.E.

Calgary, Alberta, Canada T2H 2S6
Ph: (403) 258-6200 fax: (403) 258-6201
Internet: cryptkey@kenonic.com

CIRCLE 584 ON READER SERVICE CARD

Over six million in use worldwide



Why this dongle protects more software than all others combined

More developers rely on Sentinel®, from Rainbow, than any other software protection in the world.

For good reason. Only Sentinel protects your software on any platform with 99.98% reliability, the industry's best. Our quality standards are ISO 9002 certified.

Sentinel stops piracy with the most advanced technology. And every Sentinel is backed by the industry's largest support staff.

What's more, Sentinel's small size and transparent operation prove it was designed with your customers in mind. Ensure your revenue – protect with Sentinel and protect with confidence.

Order Your Sentinel Developer's Kit Today!

Everything you need to sell more software

Quick and easy to implement

Complete technical documentation

Sentinel key and software



SENTINEL
Software Protection

Call 1-800-843-0413

On the West Coast, call 1-800-852-8569

RAINBOW

Tel: 704/542-6680 • Fax: 704/542-6022
Offices & distributors located worldwide.

© 1995 Rainbow Technologies, Inc. Sentinel is a trademark of Rainbow Tech.

CIRCLE 585 ON READER SERVICE CARD

Key-Lok™ Security

- ☐ Fighting piracy since 1982.
- ☐ Algorithmic response
- ☐ Programmable memory
- ☐ Very economical
- ☐ Device transparent to PARALLEL/SERIAL port
- ☐ Multiple security layers
- ☐ Counters/Real-time clock
- ☐ Multiproduct licensing
- ☐ DOS/UNIX/VMS/etc

Access Control System

Diskette Drive Locks

Microcomputer Applications

3167 E. Otero Circle
Littleton, CO 80122

TEL: 1-(800)4KEYLOK

(800-453-9565)

FAX: (303) 770-1863

CIRCLE 586 ON READER SERVICE CARD

Ontrack® DATA RECOVERY



- Ontrack Data Recovery can recover data lost due to: Data corruption, mechanical failure, electrical surge, virus infection, water and fire damage.
- 24-Hour worldwide support with weekend, priority, and on-site service available
- Expertise in virtually every operating environment. Service is also available on tape & removable media.
- Drive & tape warranty preserved by major manufacturers! Call for more information.

MN: 1-800-872-2599 • CA: 1-800-752-7557

UK: +44 (0)181 974 3522 • Germany: 0130 815 196 • France: 05 90 72 42 • Japan: (0429) 32-6365
6321 Bury Drive, Eden Prairie, MN 55346 • 2400 Main Street, Suite 200, Irvine, CA 92714

CIRCLE 589 ON READER SERVICE CARD

DATA CONVERSION

DISKS • TAPES • CARTRIDGES
CONVERSION-DUPLICATION-SCANNING

MORE FORMATS THAN ANYONE!

Quick • Reliable • Quality

WORD PROCESSORS, MINIS
MICROS, SPREADSHEETS
DATABASES, MAIL LISTS

IBM, DEC, APPLE, WANG
HP, WordPerfect, MS-Word



Lotus
Dbase
MICOM
LANIER
CPT, NBI



3480/3490, DC2120
8/4MM, XEROX, CP/M, UNIX ...

NATIONAL DATA CONVERSION

5 East 16th Street, New York, NY 10003

(212) 463-7511

AMERICA'S LEADERS IN DATA CONVERSION

CIRCLE 591 ON READER SERVICE CARD

If Your Software Is Good, It's Good Enough To Steal. Protect Your Software From Being Pirated.



Call **800-841-1316** to find out how this device protects
your software and your profits.

- No programming
- Nothing new to learn
- Standalone and network protection

**SOFTWARE
SECURITY**

6 Thorndal Circle, Darien, CT 06820-5421
(203) 656-3000

Software Security International Ltd.
+44- (0) 1784-430-060

CIRCLE 587 ON READER SERVICE CARD

DATA RECOVERY IN HOURS

- Over 10 years of experience with clients worldwide including HP, NASA, & FedEx.
- We've recovered more than half-a-million megabytes of lost data.
- You only pay if there's a recovery.
- Call 24-hours a day.



LAZARUS

DATA RECOVERY

Working at the speed of business

800-341-DATA

415-495-5558 • FAX 415-495-5553 • RESTRICTIONS MAY APPLY
381 Clementina Street • San Francisco, California 94103

CIRCLE 649 ON READER SERVICE CARD

Security Software for DOS, Windows, and Network

Lock out unauthorized
users with
DialLOCK BOOT

- Positive Access Control
- Disable Drive A: Boot
- File & Directory Protection
- Restrict DOS Commands
- Audit PC Activity

Contact COM&DIA for more
information on securing your PCs.



COM&DIA, LLC

PO Box 97487
Raleigh, NC 27624
919 848-0001
com&dia@allen.com

CIRCLE 580 ON READER SERVICE CARD

Custom True Type

Logo's

Signature Fonts

Logo's start at \$75.00

Fax us your logo for a quote

FAX: 1-615-588-5015

Signatures \$28.95

Other Custom Services

Macros for Word & Word Perfect
Letterhead & Form Templates
Symbol & Scientific Fonts

1-800-588-7548

LIBERTY FONTS

P.O. BOX 52248
KNOXVILLE, TN 37950-2248

VISA / MC / AMEX

CIRCLE 588 ON READER SERVICE CARD

LOST YOUR DATA?

RELAX...

and let our team
of specialists recover it—
immediately—guaranteed

- Call 24 Hours a Day
- DOS, MAC, OS/2, UNIX, NetWare
- All Recovery Media
- Great Service!

2462 Weybridge Rd.
Colorado Springs, CO 80915
719.380.1616 • Fax 719.380.7022
WWW: http://asa.net/totalrecall



VISA • MasterCard
Am. Express
Discover

800-743-0594

CIRCLE 590 ON READER SERVICE CARD

Data Recovery

From the HEART of Silicon Valley

- "While You Wait" for Silicon Valley. One-Day standard.
- Recovering data for our drive customers since 1986
- Hard drives, Syquest, Optical, Bernoulli
- Class 100 Clean Room
- Proprietary Oculiscope Alignment

Liberty
Systems

(408) 983-1127
1-800-774-5044

375-A Saratoga Ave. San Jose, CA 95129

CIRCLE 593 ON READER SERVICE CARD

E-Mail/Gopher/WWW Telnet/FTP etc.,, Dial-up/Slip/PPP Free slip software **FREE** Internet



Just log on and open
your account on-line

1-217-322-1111

16.8K B/N/1

Full Internet Connection

* Long Distance Charges Apply

CIRCLE 595 ON READER SERVICE CARD

Affordable DISKETTE & CD-ROM Duplicating Equipment

MAKE YOUR OWN COPIES!

- Simple to Use.
- Super Reliable.
- A Snap to Set Up.
- Easily Pays for Itself.
- Free Media With Your Equipment Purchase.



**WE CAN ALSO DUPLICATE
CD'S AND DISKETTES FOR YOU**
24 hour turnaround. Custom
labels & packaging. Highest
quality media. Total Quality
Assurance.

800-426-0247

Fax (908) 892-6186

**PRINCETON
DISKETTE**

1101 Richmond Ave., Pt. Pleasant Beach, NJ 08742

CIRCLE 597 ON READER SERVICE CARD

DATA CONVERSION

If you want
the most
complete
conversion
services in the industry,
just call...



(800) CONVERT

Capabilities include over 6000 formats

**PIVAR
COMPUTING SERVICES, Inc.®**

165 Arlington Heights Rd. #M
Buffalo Grove, IL 60089

(708) 459-6010

SOFTWARE DUPLICATION

IN-HOUSE PRINTING

PRODUCT ASSEMBLY

THE COMPLETE SOURCE
FOR YOUR SOFTWARE
PRODUCTION NEEDS!

1-800-410-7555
Ext. 14



**Happy Copy
INCORPORATED**

4278 S. 500 W.
SALT LAKE CITY, UT 84120

DUPLICATION EQUIPMENT

For in-house
duplication.

MediaFORM
is the source.

We sell and
service high-
quality software
duplication and
labeling equipment. And we can
tailor a complete, cost-effective
system to meet your specific needs.



MediaFORM™
800-220-1215

610-458-9200 • Fax: 610-458-9554
LEASE & RENTAL PLANS AVAILABLE

DISKETTE DUPLICATION HOW TO

HIGHEST QUALITY MEDIA

- 3.5" and 5.25" Formats
- Custom Labels/Shutter Printing
- Diskette Mailers/Accessories
- Assembly Services
- Bulk and Formatted Diskettes
- Generous Volume Discounts

CD ROM Duplication

- Pre-Mastering Services
- One-off/Small Volume Runs
- Large Volume Replication
- Packaging Accessories
- Blank CDR Media 63 & 74 Min.

800-255-3142
Diversified Systems Group, Inc.
P.O. Box 1114
Issaquah WA 98027

CIRCLE 599 ON READER SERVICE CARD



Lost your data?
Don't panic, call

DATA MECHANIX

800-886-2231

The Data Recovery Experts

Virtually
every
operating
system

- DOS
- Mac
- Novell
- Unix
- OS/2

- ✓ 24-hour
- ✓ weekend
- ✓ priority
- ✓ on-site

service available

Clean-room facilities

All work done in-house

18271 McDermott Street, Suite B, Irvine CA 92714

CIRCLE 594 ON READER SERVICE CARD

RAPID REPRODUCTION SIMPLE-FAST-SMART-RELIABLE MANUAL DISKETTE DUPLICATORS AX \$1,695 AS SHOWN



- AX 1000-2000 SERIES**
- FORMATS, COPIES, VERIFIES
 - 360-6.25"/HR. - 180-3.5"/HR
 - COPIES ALL MFM FORMATS
 - RELIABLE TEAC DRIVES
 - AVG. 100,000 COPIES/DRIVE
 - STAND ALONE OPERATION
 - 1 YEAR WARRANTY
 - AUTOLOADERS AT \$2,195

**AXIOMATIC
TECHNOLOGIES
CORPORATION**

4995 Timberlea Blvd. Mississauga
Ontario, Canada. L4W 2S2
(905) 602-9270 Fax: (905) 602-9279

CIRCLE 596 ON READER SERVICE CARD

**"If DriveSavers
can't recover your
data, you might
as well give up."**

Our proprietary techniques are so
advanced, we can recover data
others might simply discard. In
fact, we take the time to make sure
you can't afford to lose it, call
DriveSavers today.

**DRIVESAVERS
DATA RECOVERY**

Call: 800-445-1904

CIRCLE 592 ON READER SERVICE CARD

Complete Software Manufacturing Solutions

Highest Quality Media & Equipment

- Diskette & CD-ROM Duplication
- Graphic Design & Printing
- Product Assembly & Packaging
- Inventory Warehousing &
Order Fulfillment

Duplication 100% Guaranteed!
Fastest Turnaround & Best Pricing



APC, Inc.
29620 Union City Blvd.
Union City, CA 94587
Local 510-489-8677
Fax 510-489-8678

REPLICATION **800-666-1007**
CIRCLE 633 ON READER SERVICE CARD

Automatic Disk Duplicator

Standalone **\$1,995**

Industrial quality duplicators at half the price. Copies up to 135 3.5" PC & Mac diskettes per hr.

1-800-887-9906

or (510) 689-1695

Lease, Rent, Trade-in

rates from \$69

CopyPro the low price leader

CIRCLE 598 ON READER SERVICE CARD



Total Project Management for Software Manufacturing and Information Distribution

- Diskette & CD-ROM duplication services
- Online information distribution services
- Authoring & electronic publishing services
- Bulk media sales (brand & generic)
- On-demand printing (manuals, mailings, etc.)
- Packaging, assembly & distribution
- Duplication equipment sales & servicing

100% guaranteed Superior quality, fast turns & best pricing

MEGASOFT

Duplicating and Distributing Information
On Disk In Print. On-Line.

Servicing the corporate and software communities since 1983

819 Highway 33 East, Freehold, NJ 07728

Tel: 800 MEGASOFT Fax: 908-462-5658

Internet Worldwide Web: <http://www.megasoft.com>

CIRCLE 602 ON READER SERVICE CARD

DUPLICATION EQUIPMENT



Up to 350 disks per hour.

StandAlones starting at:
\$1995

For more information or to order:
CALL 1-800-752-2145

Champion

Software Duplication Systems

CIRCLE 601 ON READER SERVICE CARD

ACDSee 1.24

- Super Quick Multitizes Color or Gray Pictures
- Select Actions During Decompression
- Windows, Windows 95, Windows NT
- Pan Oversize Images • Slide Shows

Incredibly Fast!

Image Viewer

Try It Free
Internet Download:
<http://dataflux.bc.ca/pub/acd/acdsee/>

WEB PAGE
<http://www.com/acd>

email acdshare@pinc.com

Orders Only 1 800 414 2237

Information 604 475 6722

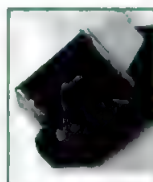
Requires minimum of 256 colors to run.

Windows is a trademark of Microsoft Corp.

CIRCLE 600 ON READER SERVICE CARD

JetMaster

Save \$\$\$
in Printing
Costs



InkJet Refill System

The most efficient, **RE-USABLE** jet printer recharge kit available. **Lowest cost per recharge in the world.** Buy one kit, then just buy ink as needed. Available in 2 oz., pint, or gallon size. Ink costs as low as \$1.00 per recharge. Waterproof inks available. Most jet printers supported.

BJ3 (Stylewriter, Canon BubbleJet) **\$29.95** JM6 MCI HP Color & Black (BJ-600/800) JM6 (HP500) Also supports high Cap. Cart.....**\$99.95**
Also supports high Cap. Cart.....**39.95** Color Jet Ink (2 oz.) (60cc)**11.50**
Black Jet Ink (2 oz.) (60cc)**10.50** BJ6-MCI Color & Bk (BJ-600/800)**49.95**

Computer Friends

14250 NW SCIENCE PARK DR. PORTLAND, OR 97229
TEL. 503 626 2291 FAX 503 643 5379

CIRCLE 603 ON READER SERVICE CARD

WHY SHOULD WE PAY YOU TO DO SOMETHING YOU'D BE DOING ANYWAY?

You like computers. You can explain computers. You hook up computers for your friends. You can install a video card without sending innocent semiconductors to their death.

We want to talk to you. We're a computer company and we're growing as fast as we can hire really good people.

Give us a reason to pay you, and you'll have a job that holds your interest as well as your future. One that gives you a chance to move up and a chance to keep up with the latest technology.

Think about it. Call us. Get a good job.

Hardware Technicians • Network Engineers • Software Trainers • Systems Consultants

Great Benefits • Smart People To Work With • Money • A Future

Fax résumé and letter to 414-223-1637 or e-mail to bkohl@alliedcg.com.

All responses confidential. Equal opportunity employer.

Allied
computer group companies

UNBELIEVABLE!

No more aches & pains

Recline! Get Productive!
Let the PowerStation®
ergonomic desk
support you!



<http://www.com/metamorphosis>
Relax at PowerStation®!

METAMORPHOSIS
800-700-9141

CIRCLE 604 ON READER SERVICE CARD

HP, IBM, Canon, Epson, NEC, Apple

TONERCartridge Remanufacturing
for Laser Printersprices from
\$45
ship incl.MICR toner, fonts, software
for check printing.**1-800-722-2804****ADVANTAGE**

LASER PRODUCTS, INC.

Est.
19872030 Powers Ferry Rd. Suite 230
Atlanta, GA 30339

CIRCLE 605 ON READER SERVICE CARD

Download the "SEXIEST" & most "STIMULATING"
Images from our ADULT On-Line Magazine - FREE!

LACE is an On-Line Magazine that offers you:

- ABSOLUTELY the best Color Photographs and Color Scans in the world & not available on any other BBS!
- COMPUTER MOVIES which playback in Windows. We offer both Video for Windows and QuickTime Movies. Download the runtime programs and a sample video file for FREE! Listen to our models talk to you and entice you.
- MULTIMEDIA FILES. Exciting Centerfold PhotoShoots, unfold right before your eyes set to exciting music!
- GORGEOUS Sexy Models both Amateur & Professional!
- LOCAL ACCESS #'s for over 1000 cities in the U.S.
- HIGH SPEED access available. (28.8k down to 2400 baud)

Set your Modem to 8-N-1 and your terminal emulation to ANSI

(818) 709-4275

Questions? Call our voice line at (818) 718-9977

LACE
the on-line adult magazine

May Only Be Accessed by Adults • Limited Offer

CIRCLE 618 ON READER SERVICE CARD

**FREE *
ADULT CD-ROM**We would like to send you our **Photo Sampler #1** for FREE*. This CD-Rom features sample Color Images of Gorgeous and Sexy Models from our top selling Photographic CD-Roms.*All we ask is that you send \$4.95 to cover our postage and handling. OR If you have a multimedia system you might want to try our **Multimedia Sampler #1**** which features both exciting Multimedia Presentations and Photographic Images from our Complete line-up of Cd-Roms.

**Only \$9.95 plus \$2.75 p/h.

(Orders outside of U.S. & Canada add \$15)

To order: Send cash, check or money order

REG Publishing - Dept. MM1

Post Office Box 5138

Chatsworth, CA 91313

By telephone call (818) 718-9979.

We accept Visa, MasterCard & AMX.

Program requires Windows 3.1. Multi-

media requires sound card. Images may be

viewed with Dos & Mac viewing programs.

Free Color Catalog Included - Adults Only!

CONFIDENTMarketplace Shoppers have
the confidence and computer
savvy to purchase direct from
your ad. Eight out of ten
bought from Marketplace ads
in the last 12 months.**60% Bought Hardware****55% Bought Software****45% Bought a Product
Or Service**Advertise Here, Where Brand
Specifiers Buy Direct!

Call 800-825-4237 Today!

Source: SEM 74 Magazine Marketplace Subscriber Study

UNCENSORED!The hottest adult BBS brings
you high quality with no
compromises.Featuring all the **ADULT GIF's!**GIF's you ever wanted (over 10 GB),
loads of original content, and more,
much more.Plus: hot chat
with people from all over the world.
And best of all: **IT'S FREE!**Absolutely no
charges, no credit
card needed, just dial and down-
load immediately.**SIMPLY DIAL:****011 852 172 94 944****Erotica East**Must be 21+ to access.
Long distance charges apply.

CIRCLE 635 ON READER SERVICE CARD

**DIRECT YOUR
ULTIMATE
FANTASY**Interactive Video
Conferencing**FREE MegaMorph GIFs**

Real Time Video AVI's

CD-ROM Titles

V LIVE!

The 42nd St. Peep Show on YOUR Computer!

908-972-4806 #4-11

Voice Support: 908-972-4949

This is NOT a 900 number! You must be 21 or older.

CIRCLE 623 ON READER SERVICE CARD

**Exclusively
Over 1300 Local
Access Numbers!**Low Rates!
No Monthly Fee!
Instant Access!Uncensored Chat!
Stories! Games!
Pictures!For Your
Local Number &
Logon Instructions call:**(800) 949-2668 (voice)****(415) 703-8230 (modem)**

(telex: bbaw.eyecom.com)

**Gay Owned
& Operated!****EYE
CONTACT**

Adults Only

CIRCLE 620 ON READER SERVICE CARD

**VIDEOPHONE
PLAYMATES****LIVE**ONE ON ONE
MOTION VIDEO
CONFERENCING
**NUDE
NUDE****EXOTIC DANCERS**

NO SPECIAL HARDWARE REQUIRED!

...an incredible revolution
in adult entertainment!**Secret City
MULTIMEDIA, INC.**KNOWLEDGEABLE STAFF!
FAST DELIVERY!
WORLDWIDE SHIPPING!**2 FREE CD-ROM ADULT SAMPLERS!****PIXIS DIGITAL EROTICA & NEW MACHINE PUBLISHING: A TASTE OF EROTICA
34 SAMPLES OF THE FINEST IN ADULT ENTERTAINMENT, ONLY \$6.75 S/H, PHONE OR MAIL ORDER!

Interactive	movies	photo	roms
Babe Patrol \$35.99	American Blond \$35.99	Manpower Gay \$29.99	
Come Play With Me \$35.99	A++! Rom \$27.99	Ornamental 1 2 or 3 \$15.99	
CyberStuds Player! \$34.99	As Time Goes By... \$27.99	Pink Passion \$29.99	
Dream Lovers Gay \$59.99	Asian Heat \$26.99	Priority Male Gay \$34.99	
Dream Machine \$39.99	Best Of Blondes \$24.99	Select-A-Pet 1 or 2 \$30.99	
GirlFriend Tera \$45.99	Black Workout Gay \$29.99	Sexual Debutantes \$29.99	
Immortal Combat \$48.99	B++s A Poppin' \$27.99	Sleazy Pink \$29.99	
Let's Connection \$39.99	Boys Next Door Gay \$29.99	Sweet Cheeks \$29.99	
Maddams Family \$39.99	Br+ Bustin' Babes \$24.99	T & A 1, 2, 3, 4, 5 or 6 \$9.99	
Men In Motion Gay \$59.99	B+L... Of Course \$24.99	Talky Glamour Girls \$29.99	
Nightwatch 2 \$31.99	David CD Gay \$29.99	Trans \$29.99	
Peepshow \$49.99	Days Gone By \$27.99	CyberSteep Blk Jck \$49.99	
Penhouse 1, 2, 3 or 4 \$59.99	Deep T+sh 1 or 2 \$24.99	CyberSteep Poker \$49.99	
Room For Rent \$54.99	Deigns & Dragns \$27.99	Hot Slots \$38.99	
Samurai Private \$49.99	DynaStuds Gay \$34.99	ManPower Gay \$29.99	
Seymour Butts 1 \$44.99	Fr+ck Club \$27.99	ManPower Gay \$29.99	
Seymour Butts 2 \$44.99	Fr+ck Show \$24.99	ManPower Gay \$29.99	
Space Sirens \$48.99	FutureWink \$27.99	ManPower Gay \$29.99	
Tokyo Nightlife \$49.99	Gang S+ts \$27.99	ManPower Gay \$29.99	
Vampires Kiss \$44.99	Gay Outdoors \$34.99	ManPower Gay \$29.99	
Virgins 1 or 2 \$39.99	Get-A-Rilla \$27.99	ManPower Gay \$29.99	
Virtual Sex+ Shoot \$49.99	Girls Will Be Boys \$27.99	ManPower Gay \$29.99	
Virtual Vixens \$39.99	Lipstick Lebbins \$27.99	ManPower Gay \$29.99	
Virtual Yours 2 \$42.99	Loads Of Fun 1 or 2 \$24.99	ManPower Gay \$29.99	

100's OF
Hot TITLES
IN STOCK!

MUST BE AT LEAST 21 TO ORDER!

800-643-4205

(818) 786-0995 • FAX (818) 786-7018

5818 Van Nuys Blvd., Van Nuys, CA 91401

CALL FOR FREE
ALL NEW 32-PAGE
COLOR CATALOG!

CIRCLE 622 ON READER SERVICE CARD

Sexy Software™ Sexy Software™

SEXY DISKS™ SEXY CD-ROMS™

Sexcapades™ ... The GAME

The First Adult Game with TRUE SOUND and 256 Color VGA Graphics

For that evening you won't forget with a loved one or group of very close friends. Fulfill your sexual desires. Find out how your partner would really like to make love. Over 80 Color VGA Scenes • Real Voices Guide the Action • Foreplay Option • Play with 2-8 Close Friends. SoundBlaster™ supported!

PRICE: \$79 or \$69 with purchase of any other product sold herein

NEW! 101 Shots - We have picked 101 of the hottest pictures in 800 x 600 SVGA from our library of over 1 million pictures! Only for the truly discriminating collector. Regular Price: \$49.

SPECIAL INTRODUCTORY PRICE \$35.

NEW! INTERACTIVE GIRLS CLUB

Challenging erotic interactive adventures!

Imported from Europe! Full-motion video scenes

IG 1 TERESA The House Guest - only the night moves allow you to score with Teresa

IG 2 JO GUEST The Milk Round - find the night house on the night day and Jo Guest will be your prize

IG 3 VIDA at the Café - try to entice Vida to your apartment and pose for you

Price \$49 each, 2 for \$89, all 3 for \$119

FREE PC Foreplay Bonus Program (\$15 value)

with any Interactive Girls purchase

ORIGINAL Sexy DISKS

6 disk set with movies, pictures, games \$32

ADD \$4.50/3.5" or FOREIGN ORDERS ADD \$2/DISK • IN PA ADD TAX • MUST 21+ TO ORDER

VISA/MC ORDERS ONLY: 800-462-SEXY (7399) EXT. 600DN/ 24 HRS/7 DAYS

FAX (215) 997-2571 • Or CK/MO to Sexy Software, P.O. Box 220, Dept 600DN, Hatfield, PA 19440

CIRCLE 610 ON READER SERVICE CARD

SUPER CD-ROM SALE

All CD-ROMS: \$59 each or 3 for \$149

Sexy INTERACTIVES

Sexy CD A - ORAL FIXATION - the first INTERACTIVE SKILLS CD-ROM database allows moving by 1000 grade, category, description.

Also named: 100% Video pictures, sex every other day!

Sexy CD B - PLAN 69 FROM OUTER SPACE - Interactive science fiction sex extravaganza! 2 movies in 1 - play over movie or play enhanced movie with scenes from original Plan 69 from Outer Space - also create unlimited GIFS from movie

Sexy CD C - PRINCEMANIA - 2 CD set contains 1200 MB of European movies in DOS and Windows - with a fantastic adult arcade game containing 4 adult games within the master game - nothing else compares to this disk!

Sexy FLIX

100 MESSAGES TO SAY NO KING D. SEXCAPADES, SEX GAMES, ASIAN LADIES 1 & 2, SAMURAI PEPPER, BUSTY BABES 1 & 2, VIRTUAL VICES 1 & 2, NIGHTWITCH 1 & 2, SENSUAL BUTTS 1 & 2, DREAM MACHINE, HURRICANE, HOT PICS 4 & 5, DANCING FANTASIES, BUSTY ENCOUNTERS 1 & 2, ANIMATION FANTASIES

Sexy PIX™

Sexy CD #1 the premier adult collection - 450 MB of action with over 7500 VSA pictures, stories, cartoons, games, sound files. (GAMES TO COMPARE!)

Sexy CD #2 an exclusive collection containing over 1000 Super VSA pictures (1024 x 128 x 256) and over 500 MB of true 24 bit color. The women and the quality are stunning!

Sexy CD #3 another collection of over 450 MB of the hottest pictures available. Over 3000 VSA pictures, movies and utilities. MENU DRIVEN VIEWING - NO DUPLICATION

\$19 CD-ROM BLOWOUT / CALL FOR TITLES

GAY MEN

Over 1300 Local Access Numbers!

Low Rates! Instant Access! No Monthly Fee! No Other Services to Join!

Uncensored Chat! Stories! Games! MatchMaker! Pictures!

For Your Local Number & Logon Instructions call:

(800) 949-2668 (voice)
(415) 703-8200 (modem)
(telnet: bbs.eyecan.com)
(www: http://www.eyecan.com)

CONTACT Gay Owned & Operated!

CIRCLE 612 ON READER SERVICE CARD

FREE Internet

- FREE PPP
- FREE Launcher Software
- Get On-Line Immediately!
- Telnet To Other BBS's
- 128 High Speed (28.8k) Modems
- Surf The World Wide Web
- New User Help Menus
- Huge IRC & MUD Menus
- POP-Mail, PINE, Elm, E-mail

1-217-792-2PPP

All You Pay For Is The Call.

CIRCLE 613 ON READER SERVICE CARD

FREE NO CHECK OUT FREE

Required at

HOTEL CALIFORNIA

"The Premier West Coast BBS"

- Over 64 Lines Available-14 4 & 28.8
- Full Internet-IRC FIP Telnet WWW, etc.
- 50 CD-ROMS Online - Over 40 Gigs of Files
- Adult Gifs, Movies, Games & Utilities
- Adult and Standard Chat Lines w/Worldwide™
- Multiplayer Games Online - Doom, Heretic, MUOS
- On-Line Matchmaking, Trivia
- Up to Date News, Weather & Sports
- And Much, Much More

Immediate Access Via Credit Card

Set your Modem to 8-N-1 and Dial

(210) 407-1300

or

Telnet to 165.50.141.2 (xlnyeb.com)

CIRCLE 614 ON READER SERVICE CARD

ADULT CD-ROMS

FREE CATALOG! We BEAT any Advertised Price!

INTERACTIVE GDS	DIGITAL MOVIES
Virtual Sex Shoot • new • \$56 + 1/2 Screen, 2x Digital Background	Big Boo, Babes • Full Screen • \$29
Vampire's Kiss • \$49 + 1/2 Screen, 2x Digital Background	Dripping with Desire • \$23
Maddams Family • \$39	Sexual Instinct • \$23
Virgins 1 & 2 • \$39 ea	Baby's Got B. II • \$23
The Barlow Affairs • \$32	Hidden Obsessions • \$23
Inferno • \$32	
Dream Machine • \$48	

PHOTO DISCS

Elite American Girls Volumes 1&2	\$29 ea
Elite European Girls Volumes 1&2	\$29 ea
Virtual 3D Adult Sampler CD	\$9.95

4 CD SUPER SAVER BUNDLES!!

Vampire Bundle 4 CD ROM Titles (Vampire's Kiss, Baby's Got B. II, Elite American v1, Sampler)	\$99
Virtual Shoot Bundle 4 CD ROM Titles (Virtual shoot, Baby's Got B. II, Inferno, Sampler)	\$99
Maddams Bundle 4 CD ROM Titles (Maddams Family, Baby's Got B. II, Inferno, Sampler)	\$99
Virgins Bundle 4 CD ROM Titles (Virgins, Baby's Got B. II, Barlow Affairs, Sampler)	\$99
Gorgeous Girls Bundle 4CD ROM Titles (Virgins, Elite American & European Girls, Sampler)	\$99

SPOT LIGHT CD DISCOUNT

21115 Devonshire St #304 Chatsworth CA 91311

Domestic: \$5.95 for shipping & handling.

Foreign orders: 818-772-6969

Fax orders: 818-773-8314

URL: <http://www.lyb.com/CD-Discount>

VISA/MC ORDERS: 1-800-990-9077

Must be 18 or older to order. Void where prohibited and restricted.

CIRCLE 611 ON READER SERVICE CARD

the electric Sex Shop

www.sexshop.com

"What's Cool" in global Web sites - Netscape Communications

Visit us on the Web or call:

800-SEX SHOP

Order by fax at 1-602-804-0545 - Adults 21 and over only.

Virtual Valerie 2 - \$45!	Virtual Sex Shoot Q-time VR - \$45!
Seymore Butts 2 - \$45!	Six Pack Explosions:
Debutantes 2 - \$45!	• Adult Six Pack Vol 1 or 2 - \$45!
Private Prison - \$45!	• Platinum Six Pack - \$45!
Maddam's Family - \$45!	• Seymore's Six Pack - \$45!

CIRCLE 615 ON READER SERVICE CARD

FREE BodyCello

ADULT CATALOG!

Call, write or FAX for your free 46-page color catalog! Outside the U.S. & Canada send \$5 s/h.

BodyCello CD Sampler*

You get over 140 full-screen, beautiful, nude color photos and artwork. Plus, check out our new interactive titles.

MAC/MPC #777, \$8.95*

MAC PC	CD-ROM Title**	Price
2-225	2-225 Seymore Butts 2	\$49.95
2-430	2-430 Midnight Stranger	\$9.95
2-432	2-432 Big B... Buddies	\$9.95
2-101	2-101 Heavenly Bodies v.3	\$9.95
2-222	2-222 Couples	\$9.95
2-427	2-427 Penthouse Interactive	\$79.95

* Add \$2.00 s/h for the BodyCello CD Sampler in U.S. and Canada. Outside the U.S. & Canada add \$5 s/h.

** Add \$5 s/h in the U.S. and Canada. Outside the U.S. and Canada add \$15 s/h.

Some titles available in diskette versions.

1-800-922-3556

Must be 21 to order. Dealer inquiries welcome.

BodyCello • Box 910631 • Sorrento Valley, CA, 92091

Info: 619-678-6868 • FAX 619-636-2397 • PM

CIRCLE 616 ON READER SERVICE CARD

ANOTHER WORLD BBS

TELNET THROUGH THE INTERNET

FREE

- FREE Initial Access
- TELNET To Us Through The Internet
- Unlimited Usage
- 100,000 Shareware & GIF's, Windows, Mac and DOS titles
- Adult Forums & Sexy Chat
- Latest Shareware, Internet Tools and Games

TELNET TO: AWOL.COM

Must be 18+ To Access.

GAY MODEM

FREE ACCESS

1-217-792-3671

Must be 18+. Customer Support Voice Line 415-881-2154

CIRCLE 617 ON READER SERVICE CARD

Al Goldstein's notorious weekly cable-TV show has been entertaining, titillating and insulting viewers for more than 20 years. Until now, only New Yorkers have been able to enjoy the weekly satire, rousing adult features and the wild rantings of the show's portly producer, Al Goldstein.

Now you too can revel in the adult fun and mayhem that made Midnight Blue famous. Al Goldstein's multimedia extravaganza, **The Best of Midnight Blue on CD-ROM, Vol 1**, is loaded with satire, bawdy entertainment, insane commentary and interviews with mainstream celebrities as well as adult video stars. And you'll get footage so hot it was censored from the cable version of the show.

Find out what makes New York cable viewers stay up late. Get Al Goldstein's **The Best of Midnight Blue, Vol 1** now! PCs only. \$39.95

AL GOLDSTEIN PRESENTS THE BEST OF MIDNIGHT BLUE

on CD-ROM, Vol 1

Call 1-800-347-SMUT and charge it to Visa, MasterCard or American Express. Or, send a check or money order for the total plus \$7.50 per copy (S&H) to Blue, Ink., 175 Fifth Ave., Suite 2102, New York, NY 10010. New York residents add sales tax. Allow 4-6 weeks for delivery.

ADULTS ONLY

CIRCLE 606 ON READER SERVICE CARD

Where Adults Come To Play!

California's Best In
HOT MODEM FUN!
Nationwide Access Plus 1-800s & Telnet

- Great Fun for Singles & Couples!
- Live Nightclub Action 7 Days a Week!
- Straight, Bi & Gay Users Welcome!
- LIVE CHATS with Thousands of Ladies & Gents in Groups or in Private!
- Erotic Adult Photo GIF Libraries!
- Ton's of Sizzling Hot Message Areas!
- Matchmaker DatingBase Connections!
- Live Competitive Gaming with Prizes!
- Internet Services Including IRC, FTP, TELNET, GOPHER, ARCHIE & More!
- Plus Much, Much, More!

ODYSSEY
O N L I N E

CALL NOW BY MODEM For Access Info
& Special Membership Offers!

818-358-6968

or TELNET: odyssey.ody.com

Over 18

8-N-1

CIRCLE 607 ON READER SERVICE CARD

MILLIONS OF ADULT IMAGES IN OUR PRIVATE LIBRARY

- *New GIFs from the library added weekly!
- 100% original GIFs and JPEGs
- 16 lines, never a busy signal
- 28.8k modems for fast connections
- Check out the ELITE Series
- Thumbnail previews
- Prices as low as \$2.75/mb
- Unlimited connect time
- 14 CD-ROMs online
- For adults only

Gourmet 1 (408) 956-5656
gallery 1 (408) 956-5662 (28.8K)

MEN SEEKING MEN INTERACTIVE

Finally! The personals come alive!
Just choose the guys you want to see,
read their ads, see their bods, and
watch them jump into action.

Over a full hour of all male
digital video for both Mac and PC!

\$49.95

For Orders Only Call:
1-800-898-9989

Must be 21 to order. Dealer inquiries welcome.

All-male adult CD-ROM entertainment

Customer Service and Technical Support:
1-212-219-8271



Hardwood
Software

CIRCLE 608 ON READER SERVICE CARD

adult CD ROM

Ask about our new
CD-ROM Sampler!

Adv. of Seymore Butts
Dream Machine
Midnight Stranger
Myst
Nightwatch II
NueroDancer
Scissors N Stones
Virtual Valerie
Virtual Vixens

Many Other Titles Available!

order your FREE catalog today!

1-800-321-6830

Interactive Impressions, L.L.C.
P.O. Box 241236 • Omaha, NE 68124-3236

CIRCLE 609 ON READER SERVICE CARD

PC Magazine's BusinessCard section is a forum for innovative, hard-to-find and low-cost PC products and services. Ads are listed by product category and include Reader Service numbers to allow fast, easy response.

RATES:

1 issue—\$960, 3 issues—\$840, 6 issues—\$815,
12 issues—\$770, 17 issues—\$730, 22 issues—\$720.
Multiple-ad per issue rates also available. Prepayment must accompany each insertion. VISA/MC welcomed.

AD FORMAT:

PC Magazine will typeset each BusinessCard ad. Advertisers should furnish typewritten copy. Ads include:
1) Headline (1 line, initial caps=30 characters max, all caps=25 characters max), 2) Descriptive copy (5 lines, 225 characters max), 3) Company name (same specifications as headline), and 4) Address and telephone number (2 lines, 40 characters per line). No logos, artwork or camera-ready ads. Publisher reserves the right to edit supplied copy to meet section specifications.

DEADLINES:

PC Magazine is published 22 times a year, (bi-monthly except for July and August). The BusinessCard closing is approximately two months prior to issue date.

Please send copy and payment to:
PC Magazine BusinessCard
One Park Avenue, 3rd Floor
New York, NY 10016

For more information, call 800-825-4237 or 212-503-5115, FAX: 212-503-5860.

HARDWARE BATTERIES

INCREASE YOUR BATTERY LIFE!

Your "2-Hr" battery only lasts 1 Hr? Try our 3000+ Long-Life Batteries, Chargers & Car Cords, for Notebook, Cellular, Camcorder. Battery Boost Software \$25! Order FREE catalog/guide to longer battery life! Best Prices, 1 Yr Wrrty, V/MC/PO.

POWER EXPRESS

3 Portola Rd., Unit A, Portola Valley, CA 94028
Order 24hrs/Day! 800-769-3739 F415-529-0140

CIRCLE 651 ON READER SERVICE CARD

SOFTWARE BUSINESS APPLICATION

All New ProBooks™ for Dos/Windows

Complete, Professional, Integrated, Modifiable, Accounting in FoxPro2.6 DOS and Windows. Awesome Features, Point-of-Sale & Bar Codes. The Easiest of Them All!™. Save Thousands. Try it Yourself-Working Demo \$20.00. V/MC/CD

PC ACCOUNTANT™ / ProBooks™

P.O. Box 2278 Kirkland, WA 98083
Free Info 800 827-1303 Or Fax 206 827-4361

CIRCLE 656 ON READER SERVICE CARD

SAVE HOURS OF RESEARCH TIME!

Demo the latest products, listen to the industry leaders, see the latest case studies, and more on the new Collaborative Computing Industry CD-ROM Sampler™. The single source for analysis and trends in the collaborative computing industry. \$99

Creative Networks, Inc.

480 Lytton Ave., Suite 6, Palo Alto, CA 94301
T: (415) 326-9926 F: (415) 326-4014

CIRCLE 661 ON READER SERVICE CARD

COMPUTER BATTERIES & MORE

Batteries for laptop/NB/PB, CMOS, camcorders, cameras, RC vehicles, toys, cordless phones/drills/shavers, cellular, remotes, pet fences. UPS/LANS, Ni-Cads, chargers, etc. WE REBUILD! CALL & ASK! WHOLESALERS V/MC/AmX/Dscr/POs.

BATTERY EXPRESS

713 Gladstone St., Parkersburg, WV 26101-5661
800-666-2296/304-428-2296 fax: 304-428-2297

CIRCLE 652 ON READER SERVICE CARD

CALL ACCOUNTING SOFTWARE

Calculates cost of phone calls immediately. Lodging resale apps. for hotels, hospitals, schools, RV parks, etc. Client billing apps. for accountants, lawyers, consultants, etc. General business apps. for departmental or project accounting.

TWENTY-FIRST CENTURY

PO Box 1419 • Santa Barbara, CA 93102
voice:(805) 964-6677 • fax: (805) 964-5007

CIRCLE 657 ON READER SERVICE CARD

COMMUNICATIONS

Fax Directly From Windows Apps

FFWIN and the FaxFacts software solution team up to provide hands-free faxing and high volume broadcasting from any Windows app. Unlimited # local/global phonebooks permitted. FFWIN is network based; 100% user configurable.

COPIA INTERNATIONAL, LTD.

Wheaton, IL 60187 800-689-8898
DEMO: 708-924-3030 Request: 889829

CIRCLE 662 ON READER SERVICE CARD

LAPTOP BATTERIES AND MORE

Batteries for Laptops, Notebooks, Powerbooks, Cellular Phones, Camcorders, Custom Rebuilds, Pulse Power Chargers for Cellular Camcorders that Eliminate Memory Effect. Call for Specs. Call Today Best Prices 1YR. Wrrty Corp PO/V/MC

VRA BATTERIES

16541 Redmond Way #251 Redmond WA 98052
800-747-8876 24HRFax 206-881-8874

CIRCLE 653 ON READER SERVICE CARD

TimeClock Manager™ Software \$195

A daily 15 min error can cause a \$422/yr expense! TimeClock Manager™ operates under MS-DOS or Windows V3.1. Features easy Punch In/Out screen, time card printout, gross pay calc., "max time" alert, personnel file, message center, more...

MBA, Incorporated Since 1983

2047 Old Middlefield Way, Mt. View CA 94043
(800) 456-2622 FAX (415) 967-3404

CIRCLE 658 ON READER SERVICE CARD

Create Voice/FAX/BBS/XBase Apps

Create stunning multi-line BBS, voice, fax apps using DAX! FoxPro/Clipper/dBase/Paradox, Royalty-Free runtime avail PC/MAC versions-Editor's Choice Award. Call for starter kit now! Non-Prog. & Prog. Welcome. Comm. knowledge NOT required

Ram Research

1920 Monument Blvd. Concord CA 94520
510-603-1122 Fax:510-603-1125

CIRCLE 663 ON READER SERVICE CARD

COMMUNICATIONS

KEYBOARD, VIDEO, MOUSE

EXTENSION with EXTENDER
SPLITTING with COMPANION
SWITCHING with COMMANDER
Boosts SIGNALS UP to 600 FT. Control Up to 96PC's with one KEYBOARD and MONITOR.

CYBEX CORPORATION

4912 Research Drive, Huntsville, AL 35805
PHONE 205-430-4000 FAX 205-430-4874

CIRCLE 654 ON READER SERVICE CARD

CD-ROM TITLES

CDROMS!CDROMS!CDROMS!

WE OFFER THE BEST IN CD-ROM TITLES OF ALL TYPES-GAMES, PRODUCTIVITY, EDUCATIONAL, AND ADULT. WE ALSO OFFER A CD PREVIEW PROGRAM, AND SHAREWARE SW ON DISKETTE. CONTACT US FOR FREE LISTS. JOIN THE CD-ROM REVOLUTION!

CLEARLIGHT SOFTWARE

DEPT. PCM, P.O. BOX 1411, MILWAUKEE, WI 53201
(VOICE/FAX) (414) 982-2616

CIRCLE 659 ON READER SERVICE CARD

DATA BASE

The Fastest xBASE Engine

CodeBase provides C, C++, Visual Basic and Delphi programmers with the fastest xBASE compatible database engine. Get multi-user compatibility with FoxPro, Clipper and dBASE files. And it's portable from DOS to Windows to UNIX!

SEQUIER SOFTWARE INC.

P.O. Box 575 Newmarket, NH 03857-0575
Phone: 403 437 2410 FAX: 403 436 2999

CIRCLE 664 ON READER SERVICE CARD

INPUT/DATA/ACQUISITION/BAR CODE/ POS

BAR CODE LABEL PRINTERS

Thermal/thermal transfer label printers combine popular features and low cost with impeccable print quality on bar codes, graphics and text; also ribbons and labels, EASYLABEL® software and accessories. Reseller inquiries are welcome.

THARO SYSTEMS, INC.

Box 798, Brunswick, OH 44212-0798
216-273-4408 Fax 216-225-0099

CIRCLE 655 ON READER SERVICE CARD

GREAT TITLES - FREE CATALOG

Looking for those fantastic new CD-ROM's? We have the best! Why wait any longer? Call, write, or FAX today for your FREE DataBarry CD-ROM catalog. (CIS: 74407, 3420)

DataBarry

3972 Barranca Pkwy, Suite 640, Irvine, CA 92714
800-530-2580 FAX: 714-651-0395

CIRCLE 660 ON READER SERVICE CARD

High-speed dBASE files in Windows?

You bet! Our ROCK-solid Engine Technology (ROCK-E-T) offers Windows developers (VB, VC++, Delphi, etc.) the fastest multi-user access to .DBF files & Clipper, FoxPro & HiPer-Six indexes & memos. Browser & Data Controls (VBX) Incl. Sg-user \$149.

SUCCESSWARE INTERNATIONAL

27349 Jefferson Ave, Temecula, CA 92590
800-683-1657/909-699-9657/Fax:909-695-5679

CIRCLE 665 ON READER SERVICE CARD

DATA ENTRY**The Data Entry Emulator™**

Full featured, heads-down data entry with two-pass verification, edit language, operator stats, batch control, output record reformat, on-line help, free tech support. For PC, PC LAN, S/36, or AS/400.

Computer Keyes

21929 Makah Road, Woodway, WA 98020
800-356-0203/206-776-6443/Fax: 206-776-7210

HEALTH/FITNESS/NUTRITION**Put a Doctor In Your PC**

New! Health software \$39.95 (Reg. #79.95)
Now the brains of a medical specialist can be at your fingertips. Reduce your risk for common health problems & become health smart. Windows 3.1 program. Introductory cancer screening module.

Examed Inc.

8008 Frost St Ste. 100 San Diego CA 92123
Phone: 1-800-327-3193 Fax: 619-560-6570

CIRCLE 672 ON READER SERVICE CARD

MEDICAL/DENTAL**Lytec Medical/Dental**

Advanced practice mgmt for DOS & Win. Patient & insurance billing, accts receivable, electronic claims, practice mgmt, prsnl info mgmt, prsnl fin., sched., graphics, laser forms, multi-user, multi-provider & more. 60 day money back guarantee.

Lytec Systems, Inc.

7050 Union Park Center, Suite 390 Midvale, UT 84047
Tel: 1-800-735-1991

CIRCLE 678 ON READER SERVICE CARD

EDUCATION**FREE HOME STUDY CATALOG**

You can be a Programmer or Systems Analyst. Courses: C, C++, VBASIC, OP-SYS, DATA-STR, MSWORKS, MSOFFICE, MULTIMEDIA, Etc. You get: Textbooks, all SW, Videos, Audio Tapes, Instructor help! Earn CEU's and Diploma. Price low as \$99.

Institute of Technical Studies

We are Licensed, Bonded and Accredited.
CALL 1-800-9-ITS-ITS (24 HOUR SERVICE)

CIRCLE 667 ON READER SERVICE CARD

MAILING LIST MANAGEMENT**Mail Order Manager (™)**

America's favorite integrated solution for mail/phone order business - order entry, credit card processing, UPS manifest, accounting, telemkt'g, mailing list mgmt & more! Single & Multi-user systems starting at \$1195. Working Demo \$25 (Ref)

Dydacomp Development Corp.

150 River Road, Ste N1 Dept.PCM, Montville, NJ 07045 Tel:800-858-DMOM or 201-335-1256

CIRCLE 673 ON READER SERVICE CARD

PRACTICE BILLING

MD VersaForm, easy, ledger-based design, Managed care support. No per-claim charge ECS for Medicare/Medicaid/DME. Customizable reports, screens & files. LAN support. From \$1,295. Free lit/demo. Dealers wanted.

Applied Software Technology

591 W. Hamilton Ave., Ste. 201, Dept.99
Campbell, CA 95008 (800)678-1111 Ext. 99

FINANCIAL/ACCOUNTING**CHECK PRINTING ON HP LASERS**

- Micr-Font Cartridge, Toner Cartridge, Made Easy Manual, Gage, Check Paper.
- Digitizing Service for forms, signatures & logos.
- Removable Memory Cartridge up to 2MB.
- Check Software.

PRINTERM DATASCRIBE INC.

Olympic Twrs #200,300 Pearl St,Buffalo NY 14202
1-800-267-8925 Fax: 716-842-6049

CIRCLE 668 ON READER SERVICE CARD

MANUFACTURING/INVENTORY**MAINTENANCE MANAGEMENT**

PC-based system for the small to medium size business. FEATURES: Work Orders (space for detail instructions & safe work procedures), equipment descriptions, historical data, operating & analytical reports, inventory. Write for free Demo!!

PENGUIN COMPUTER CONSULTANTS

P.O.Box 20485, San Jose, CA 95160
800-521-0545 (408)997-7703 Fax (408)927-0570

CIRCLE 674 ON READER SERVICE CARD

MD / PT / DC / DDS / Specialists

- EClaims for Windows \$99 • Billing Mgr \$489
- Office TimeClock \$195 • Office Mgr \$995
- Nutr/Stress Eval \$189 • Practice Mgr \$1895
- E-Voice Notes & Practice Mgmt Integration - Call — Dealer Inquiries Welcome —

MBA Inc - Healthware™ Since 1983

2047 Old Middlefield Way, Mt. View CA 94043
(800) 456-2622 FAX (415) 967-3404

CIRCLE 679 ON READER SERVICE CARD

FOREIGN LANGUAGES/FONTS/TRANSLATIONS**FOREIGN LANGUAGE SOFTWARE**

"WE ARE THE STANDARD" over 150+ Languages
Developers of Translators, Dictionaries, Fonts, OCR
Japanese, Russian, Chinese, Portuguese, Spanish
what ever your language needs CALL US 1st
FREE catalog BEST SOFTWARE BEST PRICES

TransLanguage Inc.

PO Box 18024 Anaheim Hills CA 92807
800-308-8883/714-998-1293/FAX714-998-1296

CIRCLE 669 ON READER SERVICE CARD

E-Z-MRP™ Manufacturing Software

Complete manufacturing software for material requirements planning. Includes bill of materials, MRP, capacity requirements, purchase orders, labor distribution, physical inventory, AutoCAD™ interface, and more. No-risk trial. Call for free info.

Alliance Manufacturing Software

4901 Morena Blvd, Ste 122, San Diego, CA 92117
(800) 490-2520 voice (619) 490-9292 fax

CIRCLE 675 ON READER SERVICE CARD

PROGRAMMING TOOLS**DON'T WRITE NETWORK APPS!**

Without NPPC, powerful subroutine library with the simplest API available anywhere! Windows and DOS, IPX/NetBIOS. Use with C, C++, Visual Basic, FoxPro, etc. \$ back guarantee. Free demo on our BBS. \$195, w/source \$395.

SYNERGY SOLUTIONS, INC.

2150 South Country Club Dr., Mesa, AZ 85210
602-5459797Fax602-5459827BBS602-5450232

CIRCLE 681 ON READER SERVICE CARD

LEADER IN FOREIGN LANGUAGE

WE SET THE STANDARD. Over 100 languages \$25 & up. Translators, tutorials, fonts, spell checkers & related software. Japanese, Chinese, Spanish speaking staff. Call for samples/prices. FREE interactive catalog. LOWEST PRICES GUARANTEED.

CHARACTER LANGUAGE RESOURCE

2130 Sawtelle Blvd.#304A, Los Angeles,CA 90025
800-569-2099/310-996-2300/FAX 310-996-2303

CIRCLE 670 ON READER SERVICE CARD

INVENTORY MANAGEMENT

Stock-Master 4.0, com. grade system, has Stock Status Rptg, PO Write & Track, Trend Analysis, QC Rptg, Trans Hist Detail Analysis, Multi Loc support, BOM, Matl Req Planning, Serial/Lot No Track, Quote/Ord/Inv Prep.

Applied Micro Business Systems, Inc.

177F Riverside Ave., Newport Beach, CA 92663
714-759-0582

CIRCLE 676 ON READER SERVICE CARD

Visual Basic Programming Tools

Add-on tools for VB, VB_DOS, QuickBASIC and PDS, all with tutorials and full source. Custom controls, DLL's, general purpose toolboxes, assembly routines, graphics, screen design, TSR's and much more. No royalties. Free demo & catalog.

CRESCENT SOFTWARE, INC.

11 Bailey Avenue, Ridgefield, CT 06877-4505
1-800-35BASIC 203-438-5300 Fax:203-431-4626

GENERAL**USED SOFTWARE**

Used IBM compatible software. Save up to 50% on current versions - huge savings on prior versions. Includes ORIGINAL DISKS and MANUALS - guaranteed complete & virus free. VISA, MC & AE. Call 8am-5pm EST Mon-Fri for FREE price list.

RECYCLED SOFTWARE

PO Box 266, Kings Mills OH 45034
800-8512425fx:513-4590435recycledsw@aol.com

CIRCLE 671 ON READER SERVICE CARD

MULTIPLY—

Your sales by handing your business card to 1,044,227 buyers at one time in the place where they seek to buy—tell them about your product in PC Magazine Marketplace BusinessCard.

BusinessCard

Call your BusinessCard representative today.
1-800-825-4237

RELIGION**Bible Study Software**

For 10 years we have remained the leading Bible study software company. Think of us as a Bible bookstore with an integrated family of software products for your Bible study needs! Call for a FREE catalog!

Bible Research Systems

2013 Wells Branch Pkwy. #304 Austin, TX 78728
1-800-423-1228 1-512-251-7541

RELIGION

CHURCH MANAGEMENT SOFTWARE

PowerChurch Plus for Windows is making church management easy for over 40 denominations. Membership records, contributions, full fund accounting, network support and much more. Call today for FREE INFO in the mail.

F1 SOFTWARE

208 Ridgefield Drive, Asheville NC 28806
(800) 486-1800 Fax (704) 665-1999

CIRCLE 84 ON READER SERVICE CARD

DATA CONVERSION/DATA RECOVERY

TAPE CONVERSION & DUPLICATION

ALL TAPE TYPES (1/4", TEAC, 4mm DAT, 8mm EXABYTE, DEC TKxx, 1/2", 3480, 3490) & All Formats (MICRO, NETWORK, UNIX, MINI & MAIN-FRAME) - Very Fast Turnaround & Realistic Pricing. Full Service for Data Recovery including Overwrites.

VOGON

USA 405-321-2585 Fax: 405-321-2741
UK 44-(0)1734-890042 Fax: 44-(0)1734-890040

CIRCLE 892 ON READER SERVICE CARD

PC AND LAN TRAINING

Onsite and Public Seminars Nationwide
PC Troubleshooting, Maintenance & Upgrading
Managing PC Software
Configuring PCs & Optimizing Performance
Understanding & Using LANs

CORNERSTONE TRAINING CORP.

5 Jillian Court, Spotswood, NJ 08884
908-251-6300 908-251-6366 FAX

CIRCLE 891 ON READER SERVICE CARD

SCIENTIFIC/ENGINEERING

101 ENGINEERING PROGRAMS

Hydraulic systems, Fluid, Pipe Size, Gear Forces, Conveyor HP, Belt Size, Bending Moments, Helical Spring, Shop Math, Machine Design, etc. Complete package (All 101 Pgms) for only \$295.00 + other FREE software, FREE catalog.

UNIK Associates

4065A N. Calhoun Rd. Brookfield, WI 53005
Phone: 1-800-781-5990 Fax: 414-781-5335

CIRCLE 885 ON READER SERVICE CARD

PROTECT YOUR BUSINESS!

Don't let a disaster put your business out of business. eVAULT Remote Backup Service offers secure, off-site, automatic backup of critical files via modem. There's no registration fee. For a limited time, the first month is free.

eVAULT Remote Backup Service

P.O. Box 1970 Cupertino, CA 95015-1970
Tel: (800) 382-8581 Fax: (408) 255-4881

CIRCLE 891 ON READER SERVICE CARD

MISCELLANEOUS/ACCESSORIES

Keys for Efficient Computing

Reduce errors, repetitive keystrokes and extensive training with KDM custom keys, keycaps and keyboards. Productivity soars as users become familiar with special function keys and macros. Call today for free info.

KDM Associates, Inc.

20W345-D 101st St., Lemont, IL 60439
800-536-6160 Ext. 214

CIRCLE 897 ON READER SERVICE CARD

EXPERIMENTAL DATA FITTING

SCIENTIST, now on Windows, fits experimental data to any combination of user-defined algebraic and differential equations, and Laplace transforms—also determines best-fitting splines, polynomials and interpolating functions.

MicroMath Scientific Software

Box 21550, Salt Lake City, UT 84121-0550
1-800-942-6284 Fax (801) 943-0299

CIRCLE 886 ON READER SERVICE CARD

TRAINING/TUTORIAL

Throw Out the Manuals

Video's the easy way to learn. Save by renting. A two week rental, including S&H, costs about a dollar a day. Over 90 different titles for Windows, DOS, Excel, Word, WordPerfect, PageMaker, Lotus, etc. Get a free catalog. Ask about CD ROM rentals.

CareerTAPES® Enterprises

PO Box 309, Center Harbor, NH 03226
(603) 253-7470

CIRCLE 892 ON READER SERVICE CARD

BOOKS/CATALOGUES

COMPUTER BOOKS ONLINE

Easy online searching and ordering at our Internet, CompuServe & NIFTYServe stores. Books from 300 publishers for computing professionals. GO CBK, www.compubooks.com/books.html, or [ftp info.txt](http://ftp.info.txt) from ftp.compubooks.com. Worldwide shipping.

CompuBooks™

RR 1 BOX 2710, Cedar Creek TX 78612 USA
512-321-9652 FAX 321-4525 Orders 800-890-8818

CIRCLE 897 ON READER SERVICE CARD

STATISTICAL/RESEARCH

NCSS 6.0 for Windows

"Best value & easiest to learn/use" PC-Week Easy data import/export. Regression, T-tests, Anova, Multivariate, Graphics, Cross Tabs, Control Charts, DOE. E mail: ncss@ix.netcom.com. Web: <http://www.icw.com/ncss>. FREE probability Calc.

NCSS

329 N 1000 E, Kaysville, UT 84037
800-898-6109/801-546-0445 Fax: 801-546-3907

CIRCLE 887 ON READER SERVICE CARD

New Version 5.0

Analyzes: marketing, public opinion, customer satisfaction, employee attitude surveys. Handles mail, personal, phone, scanner, disk-by-mail or computer interviews. Records verbatim text & voice answers. Powerful, flexible, user friendly. Free support.

Creative Research Systems

140 Vista View #100, Petaluma, CA 94952-4728
Ph: (707) 765-1001/Fax (707) 765-1068

CIRCLE 888 ON READER SERVICE CARD

SERVICES COMPUTER INSURANCE

Insures Your Computer

The COMPUTEROWNERS™ Insurance policy repairs or replaces hardware, media and purchased software. Rates as low as \$49 a year covers theft, fire, accidents, power surge and more! Call for immediate coverage or info. 1-800-800-1492.

Safeware, The Insurance Agency Inc.

2929 N. High St., PO Box 02211
Columbus, OH 43202 1-800-SAFEWARE

CIRCLE 889 ON READER SERVICE CARD

88% OF PC MAGAZINE SUBSCRIBERS
PURCHASED COMPUTER PRODUCTS
DIRECT IN THE PAST 12 MONTHS ...

% OF SUBSCRIBERS

▶ Software	79%
▶ Peripherals	61%
▶ Supplies	57%
▶ Computers	48%
▶ Networking Products	34%

Sell your products direct here,
call your Marketplace account
representative today at
800-825-4237



It's smaller than a breadbox, yet as

b r o a d
as the technological horizon.

Though energy efficient,
it yields amazing power, *speed* and versatility.

Asking no questions, it
empowers you
with all the answers.

As your humble side-kick,

it will
make you a **business hero**.

It's tough out there.

Turbulent forces, changing conditions, and an ever-expanding universe of data have made today's technological environment downright mind-boggling.

But with Computer Select, you can broaden your technological horizons in seconds – not light years. Because each month Computer Select brings you:

- Over 70,000 full-length articles from over 100 leading technology publications
- Over 75,000 hardware and software specs
- More than 12,000 computer company profiles
- 19,000 definitions of computer terms
- Infographics

And, as a Computer Select subscriber, you'll receive 12 monthly updates containing the most current information on the technology marketplace – so you'll know what's hot, what's not, and what's on the "up-and-up."

Call today:

1-800-419-0313

ext. 5206, and start broadening
your horizons.



ComputerSelect
THE ULTIMATE TECHNOLOGY RESOURCE

Subscribe to ComputerSelect today, and get one free month of our newest product, IntelliSeek™ (the Ultimate Business Resource)

© 1995 Information Access Company. All product names referenced herein are trademarks of their respective companies. Offer expires August 31, 1995. Prices subject to change without notice. Please allow 6-8 weeks for delivery. Offer good in the U.S. and Canada only. For international pricing and product information, call 1-212-503-4400 ext. 5206, or fax to 1-212-503-4487 and reference source code 5206. In the United Kingdom call 44-1344-710094 ext. 5206.

Information Access Company
THE SUPERIOR INFORMATION RESOURCE

CIRCLE 158 ON READER SERVICE CARD



FOR PEOPLE WHO TAKE THEIR NETWORKING PRETTY SERIOUSLY.

Sure, some of you are more hard core than others. But whether you're linking a dozen desktops or hundreds of offices worldwide, there's only one event for you: NetWorld™+Interop® Atlanta. As the world's leading interoperability expo, we'll have over 500 top LAN, WAN and telecommunications vendors on hand. Each will be showing off the latest in high-speed networking, Internet access, client-server and more. Better yet, you

can see and test all the latest solutions on our live, multivendor, multiprotocol network—the InteropNet™. No matter how you look at it, there's simply no better way to evaluate new technologies for your business than NetWorld+Interop. So order your free pass today. We guarantee it'll leave a lasting impression.

NETWORLD+INTEROP 95

CIRCLE 359 ON READER SERVICE CARD

FREE VIP PASS • ATLANTA, GA • SEPTEMBER 27-29 • GEORGIA WORLD CONGRESS CENTER

Name _____ Company _____

Address _____ City, State, Zip _____

Phone/Fax _____ Fax: 415-525-0199 • Mail: N+I 95, P.O. Box 5855, San Mateo, CA 94402-0856

GET CONFERENCE INFORMATION VIA THE WEB AT <http://www.sbexpos.com> • QUESTIONS? CALL 800-488-2883

A400

The conference program runs September 29-29. Outside the U.S. call 415-578-6900. © 1995 SOFTBANK Exposition and Conference Company (SOFTBANK Expos). Interop is a registered trademark of SOFTBANK Expos. NetWorld is a service mark of Novell Inc. All other names are the property of their respective holders.

Advertisers' Index COMPANIES

Reader Service No.	Advertiser	Page
910	3M Data Storage Products	14-15
300	Ability Plus Software	348
*	Acer America	77-81
117	Adaptec	109
934	Adaptec	NE41
226	ADI Systems Inc.	60
017	Advanced Micro Devices	236-237
249	AEC Software	341
078	AGFA	96
289	All Micro	333
196	Alpha Software Corporation	278
296	Alpha Software	352
*	America Online, Inc.	282A-B, 536A-B
162	American Power Conversion	152
338	American Small Business	396
297	AMS	336
235	AMS	476-477
340	Anthro Technology	382
*	Apple Computers	122-123
052	APS Technologies	445
336	Arlington Computer Products	472-473
330	Arm Computers	362
254	Artisoft Inc.	26-27
902	Asante Technologies	NE37
122	AST Research	158-159
*	AT&T	208-209
127	ATI Technologies Inc.	273
*	Austin Direct	200-201
012	Austin Direct	203
898	BayNetworks	NE18-NE21
288	BBN Software	343
332	Brother International	388
292	Caere Corporation	6
245	Caere Corporation	90
277	California Software	366
*	Canon Computer Systems	64-65
187	Canon, U.S.A.	235
306	Class Act Multimedia	358
137	Compaq Computer Corporation	70-71
*	Compaq Computer Corporation	108-107
*	Compaq Computer Corporation	170-171
*	Compaq Computer Corporation	322
144	CompUSA Direct	480-481
348	Computer Associates	2-3
360	COMPUTER DISCOUNT WAREHOUSE	460-461
109	COMPUTER DISCOUNT WAREHOUSE	462-463
159	COMPUTER DISCOUNT WAREHOUSE	464-465
158	Computer Library	527
007	Connectix	325
009	Connectix	399
042	Corel Corporation	28
073	Corel Corporation	261
322	Corel Corporation	293
023	Corel Corporation	313
037	Corel Corporation	541
331	Creative Computers	344-345
032	Crosstalk/Attachmate	275
389	Crosstalk/Attachmate	359
286	CTX International	351
329	CTX	188
341	Cybermax	391
227	Data Products Corporation	231
*	Dell Computer Corporation	187
*	Dell Computer Corporation	226-227
*	Dell Computer Corporation	298
*	Dell Computer Corporation	C5-C8
050	Delphi Internet Services	542
213	Delrina Technology	18
206	Deneba Software	67
176	Diamond Multimedia Systems	287
930	Digital Equipment Corporation	NE24
327	Discovery Networks	348
201	DTK Computer Incorporated	338
307	EPS Technology	368-369
*	Epson America	10-11
354	Ergo Computing, Inc.	474
266	Ergo Computing	398
014	First Source International	456-457
075	First Source International	458-459
089	FOSA Computer Inc.	455
105	Frame Technology	415
200	FTG Data Systems	258
861	FTP Software Inc.	NE51
870	Funk Software	NE12
294	Fusion Software	335
283	Future Micro	377
*	Gateway 2000	48A-49
*	Gateway 2000	145-148

Reader Service No.	Advertiser	Page
301	General Parametrics	381
062	Hartford Computer Group	449
120	Hayes Microcomputer Products	5
136	Hayes Microcomputer Products	211
339	HDSS/HARD DRIVES SUPER SOURCE	360
*	Hewlett Packard Peripheral Group	139
*	Hewlett Packard Peripheral Group	259
*	Hewlett Packard	57
*	Hewlett Packard	58-59
*	Hewlett Packard	214
*	Hewlett Packard	284-285
*	Hewlett Packard	NE32-NE33
170	Hyundai Electronics America	205
*	IBM Corporation	126-129
*	IBM PC Corporation	181, 183, 185
*	IBM Corporation	NE28-NE29
219	Insight Direct	488-487
167	Insight Direct	488-489
027	Insight Direct	534
*	Intel Corporation	41
*	Intel Corporation	NE11
284	Kensington Microware LTD	332
106	Kingston Technology	271
019	L.A. Trade	452-453
069	Landmark	233
*	Lotus Development Corporation	239
*	Lotus Development Corporation	255
328	Lumina	353
067	Mag Innovision	388-387
083	Magitronic	454
319	Mainstay	350
365	Manugistics, Inc.	22
291	Map Info	393
124	Matrox, Inc.	23
343	Matrox	340
334	Maximus Computers	361
003	MAXTECH CORPORATION	417
299	McAfee Associates, Inc.	305
290	Media On	376
018	MegaHaus	490
138/391	Micro Mail Direct	372-373
859	Micro Solutions Computer Products	450
855	Micro Solutions Computer Products	451
302	Micro Xerperts	378-379
325	Microcom	384-385
317	Microfield Graphics Inc.	380
361	Micrografix	33
164	Micron Computer, Inc.	161-166
203	Micron Computer, Inc.	482
924	Micron Computer, Inc.	NE2-NE3
*	Microsoft	C2-1
*	Microsoft	16-17
*	Microsoft	52-53
*	Microsoft	86-87
*	Microsoft	246-247
*	Microsoft	288-289
*	Microsoft	NE14-NE15
*	Microsoft	NE42-NE43
010	Midwest Computer Works	478-479
398	Midwest Micro	437-443
356	Motorola	24-25
177	MPC Technology, Inc.	466
*	My Software Company	371
*	Nanao Corporation	324
305	NEBS Software	397
217	NEC Technologies	34-35
157	NEC Technologies	72-73
153	NEC Technologies	404-405
877	NetManage, Inc.	NE44
323	NetManage	374
318	Nikon	355
347	Nikon	357
326	Nissei Sangyo/Hitachi	367
*	Nokia	13
*	Novell, Inc.	NE8-NE9
259	Number Nine Computer Corporation	276
*	Okidata	242
*	Okidata	402
147	Optiquet	411
*	Oracle Corp.	NE16-NE17
298	Orchid	339
349	Parsons Technolgy	395
*	PC Connection	484-485
335	PC Importers	342
080	PC Power & Cooling	63
238	PCs Compleat	467
092	PCs Compleat	468-469
268	PCs Compleat	470-471

Reader Service No.	Advertiser	Page
053	PerComp Microsystems, Inc.	434-435
867	Performance Technology	NE56
928	Perle Systems	NE46
350	Persoft	383
853	Persoft	NE22
015	Phillips	98-99
295	Picturatel	392
098	Pinnacle Micro	43
324	Play, Inc.	354
148	Primavera Systems	45
067	Princeton Graphics Systems	387
056	Pro Direct	433
*	Prodigy Services Co.	249-250
929	Proteon Inc.	NE49
140	Proxima	68
884	QMS	NE27
904	Quarterdeck Office Systems	309
310	Quarterdeck	334
923	RAD Data Communications	NE35
086	Reveal Computer Products	538-539
854	Russell Information Sciences	NE5
309	S.A.G./Storage Solutions	319
046	Samsung Electronics America	82
278	Samsung	132-133
256	SCEPTRE Technologies	317
*	Scitor Corporation	84
271	Seagate Technology	300
351	Serif	365
248	Simple Technology	189
150	SmartPrint/Dresselhaus	323
359	Softbanks Expos	528
355	Softbanks Expos	537
*	Sony Computer Peripherals	155
071	Sony Computer Peripherals	157
043	SPSS, Inc.	483
061	STAC Electronics	291
*	Standard Micro Systems	347
*	Standard Microsystems Corporation	NE52
057	StatSoft	55
315	Stream International	363
081	Sunshine Computers	446
311	Supra Corporation	370
279	Surplus Software Intl	390
021	SYS Technology	447
282	Tangent Computers	394
022	Techmedia	311
166	TechWorks	475
001	Tektronix Inc.	74
304	Texas Instruments	100-101
353	Texas Instruments	176-177
280	TGV	375
303	Top Speed	364
379	Toshiba America	150-151
055	Toshiba Consumer Products	419
281	Touchstone	389
337	Traveling Software Inc.	356
920	US Robotics Inc.	36
*	US Robotics Inc.	218-219
*	US Robotics Inc.	221-224
856	US Robotics Inc.	NE7
210	USA Flex	423-425
051	USA Flex	426-427
065	USA Flex	428-429
079	USA Flex	430-431
313	Verot Publishing	337
312	Vertisoft	349
118	View Sonic	306-307
239	Viking Components	92
026	Visual Software	4
085	WinBook Computer Corporation	110-111
864	Wollongong Group	NE38-NE39
*	Word Perfect/Novell Applications	20-21
*	WRQ	NE31
163	Xerox Corporation	409
211	Xircor	266-267
*	Zenith Data Systems	118-119
038	Zeos Int'l.	88
151	Zeos Int'l.	113-116
155	Zeos Int'l.	191-196

* No Reader Service #. Please Call Advertiser For Information.

Advertisers' Index PRODUCTS

RS#	Company	Product	Page#
ACCELERATION BOARDS			
176	Diamond Multimedia Systems	Stealth 64	287
124	Matrox, Inc.	MGA Millennium	23
259	Number Nine Computer Corporation	771 Graphics Accelerator	276
166	TechWorks	Graphic Accelerator Boards	475
ADD-ON BOARDS			
283	Future Micro	Add On Boards	377
343	Intel Corporation	Intel Adapters	NE11
124	Matrox, Inc.	Graphics Boards	340
138/391	Micro Mail Direct	Memory PCMCIA	372-373
335	PC Importers	Add On Boards	342
166	TechWorks	Thunderbolt Graphics Accel	475
APPLE PRODUCTS			
	Apple Computers	Cobra Laserwriter	122-123
BACKUP SOFTWARE			
930	Digital Equipment Corporation	StorageWorks	NE24
859	Micro Solutions Computer Products	Back-up 800-T	450
855	Micro Solutions Computer Products	Back-up 800-T	451
BOOKS			
073	Corel Corporation	CD Office Companion	261
BRIDGES/ROUTERS/GATEWAYS			
902	Asante Technologies	Fast Ethernet	NE37
CAD/CAM			
338	American Small Business	Design Cad 2D & 3D	396
CD-ROM			
306	Class Act Multimedia	ClassAct95	358
158	Computer Library	Computer Select	527
037	Corel Corporation	Movie Guide	541
327	Discovery Networks	The Bear Hunter	348
014	First Source International	Memory, Software, Notebooks	456-457
219	Insight Direct	CD ROM	486-487
167	Insight Direct	CD ROM	488-489
027	Insight Direct	CD ROM	534
859	Micro Solutions Computer Products	Back-up 800-T	450
855	Micro Solutions Computer Products	Back-up 800-T	451
298	Orchid	NUSound	339
CHIPS/PROCESSORS			
017	Advanced Micro Devices	Microprocessor	236-237
014	First Source International	Memory, Software, Notebooks	456-457
	Intel Corporation	Intel Pentium Processor	41
106	Kingston Technology	Processor Upgrades	271
019	L.A. Trade	Memory	452-453
138/391	Micro Mail Direct	Memory PCMCIA	372-373
COMMUNICATIONS SOFTWARE			
032	Crosstalk/Attachmate	Crosstalk for Windows	275
389	Crosstalk/Attachmate	RLN	359
213	Deirna Technology	WinFax Pro for Networks	18
881	FTP Software Inc.	Explore on Net	NE51
299	McAfee Associates, Inc.	NetRemote	305
	Microsoft	Microsoft Mail	246-247
877	NetManage, Inc.	Chameleon 4.5	NE44
081	STAC Electronics	ReachOut	291
864	Wollongong Group	Emissary	NE38-NE39
COMPUTERS/COMPATIBLES			
	Acer America	Acer PCs and Notebooks	77-81
336	Arlington Computer Products	Peripherals	472-473
122	AST Research	Notebook Computers	158-159
	AT&T	AT&T GIS PCs	208-209
012	Austin Direct	Austin Desktops	200-201
137	Austin Direct	Austin Desktops	203
	Compaq Computer Corporation	ProLine Desktops	70-71
	Compaq Computer Corporation	Notebooks	106-107
	Compaq Computer Corporation	Desktops	170-171
144	CompUSA Direct	Mail Order	480-481
360	COMPUTER DISCOUNT WAREHOUSE	Hardware	460-461
109	COMPUTER DISCOUNT WAREHOUSE	Hardware	462-463
159	COMPUTER DISCOUNT WAREHOUSE	Hardware	464-465
341	Cybermax	Systems	391
	Dell Computer Corporation	Dell Desktops and Notebooks	CS-C8
	Dell Computer Corporation	Dell Notebook Computers	187
	Dell Computer Corporation	Dell Desktop Computers	226-227
	Dell Computer Corporation	Dell Notebook Computers	298
201	DTK Computer Incorporated	Systems	338
307	EPS Technology	Systems	368-369
266	Ergo Computing	Systems	396
354	Ergo Computing, Inc.	ThunderBrick Desktops	474
	Gateway 2000	PCs	145-146
062	Gateway 2000	Pentium PCs	484-49
	Hartford Computer Group	Mail Order	449
	Hewlett Packard	HP Vectra PCs	58-59
	Hewlett Packard	HP Net Servers	284-285
	IBM Corporation	PC 300	128-129
	IBM PC Corporation	Servers	181
	IBM PC Corporation	Commercial Desktops	183
219	Insight Direct	Mail Order Systems	486-487
167	Insight Direct	Mail Order Systems	488-489
027	Insight Direct	Mail Order Systems	534
	Intel Corporation	Intel Pentium Processor	41
083	Magtronic	Magtronic Desktop System	454
003	MAKTECH CORPORATION	Notebooks	417
290	Media On	Multimedia PCs	376
302	Micro Kerperts	Systems	378-379
164	Micron Computer Inc.	Micron PCs	161-166
010	Midwest Computer Works	PCs	478-479
398	Midwest Micro	Desktop Systems	437-443
238	PCs Complete	Mail Order	467
092	PCs Complete	Mail Order	468-469
268	PCs Complete	Mail Order	470-471
053	PerComp Microsystems, Inc.	Mail Order	434-435
021	SYS Technology	PCs and Peripherals	447
282	Tangent Computers	Servers	394
379	Toshiba America	Notebook Computers	150-151
210	USA Flex	Desktop PCs	423-425
051	USA Flex	Desktop PCs	426-427
065	USA Flex	Desktop PCs	428-429
079	USA Flex	Desktop PCs	430-431
038	Zenith Data Systems	Z-NotePlus/Multimedia	118-119
155	Zeos Int'l	Zeos AMBRA Server	88
	Zeos Int'l	Zeos Pantara Pentium PCs	191-196
DATA BASE MANAGERS			
196	Alpha Software Corporation	Alpha Software	278
	Lotus Development Corporation	Lotus CD-Mail	239
361	Micrograph	ABC Flowchart	33
	Microsoft	Microsoft Visual Fox Pro	NE14-NE15
	Oracle Corp.	Workgroup 2000	NE16-NE17
DATA COMPRESSION SOFTWARE			
009	Connectix	RAM Doubler for Windows	399
DESK TOP ORGANIZERS			
	Lotus Development Corporation	Organizer	255
DESK TOP PUBLISHING			
105	Frame Technology	FrameMaker 5	415
DIAGNOSTIC SOFTWARE			
870	Funk Software	Remote Access Software	NE12
DISK BACKUP & TAPE DRIVES			
910	3M Data Storage Products	3M Data Storage Products	14-15
052	APS Technologies	Tape Backup	445
859	Micro Solutions Computer Products	Back-up 800-T	450
DISPLAYS/MONITORS			
226	ADI Systems Inc.	Monitors	60
014	First Source International	Peripherals, Software, Notebooks	456-457
170	Hyunda Electronics America	Monitors	205
067	Mag Innovation	Monitors	386-387
010	Midwest Computer Works	Monitors	478-479
	Nanaco Corporation	Monitors	324
157	NEC Technologies	Monitors	72-73
326	Nissai Sangyo/Hitachi	Monitors	367
	Nokia	Monitors	13
015	Philips	Monitors	96-99
067	Princeton Graphics Systems	Princeton Graphics Monitors	387
140	Proxima	TBD	68
046	Samsung Electronics America	Monitors	82
	Sony Computer Peripherals	Monitors	155
071	Sony Computer Peripherals	Monitors	157
022	Technica	Monitors	311
055	Toshiba Consumer Products	Monitors/TV	419
118	View Sonic	Monitors	306-307
ELECTRONIC MAIL			
	Microsoft	Microsoft Mail	246-247
EMULATORS/PROTOCOL CONVERTERS			
853	Persoft	Starterm	NE22
FAX/MODEM			
332	Brother International	Fax/Printers	388

RS#	Company	Product	Page #
187	Canon, U.S.A.	Multipass 1000	235
014	First Source International	Memory, Software, Notebooks	456-457
075	First Source International	Notebooks, Memory, Peripherals	458-459
081	Sunshine Computers	Notebooks/Laptops	446
FLOWCHARTING			
361	Micrograph	ABC Flowchart	33
GRAPHICS SOFTWARE			
292	Caere Corporation	OmniPage	6
322	Corel Corporation	CD Creator	293
206	Deneba Software	Canvas Your Windows	67
	Microsoft	Microsoft Powerpoint	C2-1
	Nanaco Corporation	Monitors	324
026	Visual Software	Double Vision	4
HAND-HELD PC'S			
356	Motorola	Envoy, Marco Wireless Commun	24-25
HARD DRIVES			
052	APS Technologies	SCSI Hard Drive	445
014	First Source International	Peripherals, Software, Notebooks	456-457
339	HDS-HARD DRIVES SUPER SOURCE	Hard Drives	380
219	Insight Direct	Hard Drives	486-487
167	Insight Direct	Hard Drives	488-489
027	Insight Direct	Hard Drives	534
859	Micro Solutions Computer Products	Back-up 800-T	450
855	Micro Solutions Computer Products	Back-up 800-T	451
335	PC Importers	Hard Drives	342
056	Pro Direct	Mail Order	433
HARDWARE			
017	Advanced Micro Devices	Microprocessor	236-237
	Apple Computers	Cobra Laserwriter	122-123
052	APS Technologies	SCSI Hard Drive	445
898	BayNetworks	Ethernet	NE18-NE21
	Canon BJC-70 Printer	Canon BJC-70 Printer	84-85
144	CompUSA Direct	Mail Order	480-481
007	Connectix	QuickCam for Windows	325
329	CTX	CTX Notebooks	198
227	Data Products Corporation	Printers	231
	Dell Computer Corporation	Dell Notebook Computers	187
	Dell Computer Corporation	Dell Desktop Computers	226-227
	Dell Computer Corporation	Dell Notebook Computers	298
176	Diamond Multimedia Systems	Stealth 64	287
930	Digital Equipment Corporation	StorageWorks	NE24
120	Hayes Microcomputer Products	Practical Peripherals	5
136	Hayes Microcomputer Products	Dynma PCMCIA Modem	211
	Hewlett Packard	HP 10Base-T Hubs	NE32-NE33
	IBM PC Corporation	Commercial Desktops	183
	Intel Corporation	Intel Adapters	NE11
106	Kingston Technology	Processor Upgrades	271
018	Megahaus	Drives/Storage	490
398	Midwest Micro	Desktop Systems/Notebooks	437-443
147	Optique	UPS EU Promo	411
015	Philips	Monitors	96-99
056	Pro Direct	Mail Order	433
929	Proton Inc.	OpenROUTE	NE49
086	Reveal Computer Products	Reveal MM	538-539
256	SCEPTRE Technologies	Notebooks	317
248	Simple Technology	PC Cards	189
118	View Sonic	Monitors	306-307
211	Xercom	Netware	266-267
HUBS			
898	BayNetworks	Ethernet	NE18-NE21
	Hewlett Packard	HP 10Base-T Hubs	NE32-NE33
929	Proton Inc.	OpenROUTE	NE49
IMAGE EDITING SOFTWARE			
322	Corel Corporation	CD Creator	293
INFORMATION MANAGERS			
356	Motorola	Envoy, Marco Wireless Commun	24-25
INPUT DEVICES			
007	Connectix	QuickCam for Windows	325
	Epson America	EPSON ES 1000C Scanner	10-11
200	FTG Data Systems	Input/Output Devices	258
284	Kensington Microware LTD	Mouse	332
324	Play, Inc.	Snappy	354
LAN ADAPTER BOARDS			
934	Adaptec	SCSI Adapter/BAS	NE41
	Hewlett Packard	HP 10Base-T Hubs	NE32-NE33
	Intel Corporation	Intel Adapters	NE11
929	Proton Inc.	OpenROUTE	NE49
LAPTOPS/PORTABLE COMPUTERS			
	Acer America	Acer PCs and Notebooks	77-81
297	AMS	Notebooks	336
235	AMS	Notebooks	476-477
330	Arm Computers	Notebooks	362
122	AST Research	Notebook Computers	158-159
	Austin Direct	Austin Desktops	200-201
012	Austin Direct	Austin Desktops	203
	Compaq Computer Corporation	Notebooks	106-107
	Compaq Computer Corporation	Notebooks	322
	CompUSA Direct	Mail Order	480-481
360	COMPUTER DISCOUNT WAREHOUSE	Laptops	460-461
109	COMPUTER DISCOUNT WAREHOUSE	Laptops	462-463
159	COMPUTER DISCOUNT WAREHOUSE	Laptops	464-465
329	CTX	CTX Notebooks	198
286	CTX International	Notebooks	351
	Dell Computer Corporation	Dell Desktops and Notebooks	CS-C8
	Dell Computer Corporation	Dell Notebook Computers	187
	DTK Computer Incorporated	Systems	338
354	Ergo Computing, Inc.	PowerBrick Notebooks	474
075	First Source International	Notebooks, Memory, Peripherals	458-459
089	FOSA Computer Inc.	Portables	455
	Gateway 2000	Notebooks	145-146
	Gateway 2000	Notebooks	484-49
062	Hartford Computer Group	Mail Order	449
	Hewlett Packard	HP OmniBook 600	57
	Hewlett Packard	HP OmniBook 4000	57
	IBM Corporation	ThinkPad 701c	126-127
	IBM PC Corporation	Thinkpad	185
334	Maximus Computers	Notebooks	361
003	MAKTECH CORPORATION	Notebooks	417
302	Micro Kerperts	Notebooks	378-379
010	Midwest Computer Works	Hardware	478-479
398	Midwest Micro	Notebooks	437-443
356	Motorola	Envoy, Marco Wireless Commun	24-25
177	MPC Technology, Inc.	Multimedia Notebooks	466
217	NEC Technologies	NEC Laptop	34-35
153	NEC Technologies	NEC Japan	404-405
278	Samsung	Samsung Notebooks	132-133
256	SCEPTRE Technologies	Notebooks	317
081	Sunshine Computers	Notebooks/Laptops	446
304	Texas Instruments	Portable	100-101
353	Texas Instruments	Portable	178-177
379	Toshiba America	Notebook Computers	150-151
210	USA Flex	Notebooks	423-425
051	USA Flex	Notebooks	426-427
065	USA Flex	Notebooks	428-429
079	USA Flex	Notebooks	430-431
085	WinBook Computer Corporation	Winbook	110-111
	Zenith Data Systems	Z-NotePlus/Multimedia	118-119
038	Zeos Int'l	Zeos AMBRA Server	88
151	Zeos Int'l	Mendian Color Notebooks	113-116
LOCAL AREA NETWORKING			
898	BayNetworks	Ethernet	NE18-NE21
277	California Software	InterAp	366
137	Compaq Computer Corporation	ProLine Desktops	70-71
360	COMPUTER DISCOUNT WAREHOUSE	Networking Products	460-461
109	COMPUTER DISCOUNT WAREHOUSE	Networking Products	462-463
159	COMPUTER DISCOUNT WAREHOUSE	Networking Products	464-465
032	Crosstalk/Attachmate	Crosstalk for Windows	275
389	Crosstalk/Attachmate	RLN	359
213	Deirna Technology	WinFax Pro for Networks	18
930	Digital Equipment Corporation	StorageWorks	NE24
961	FTP Software Inc.	Explore on Net	NE51
870	Funk Software	Remote Access Software	NE12
062	Hartford Computer Group	Mail Order	449
	Hewlett Packard	HP 10Base-T Hubs	NE32-NE33
	Intel Corporation	Intel Adapters	NE11
	Novell, Inc.	Novell Netware 4.1 Upgrade	NE8-NE9
867	Performance Technology	Instant Internet	NE36
928	Perle Systems	Perle 833-Remote Access Server	

Advertisers' Index PRODUCTS

RS#	Company	Product	Page#
163	Standard Microsystems Corporation	Tiger Stacking Hubs	NE52
211	Xerox Corporation	Xerox 4900	409
	Xircom	Netwave	266-267
MAIL ORDER			
297	Acer America	Acers PCs and Notebooks	77-81
235	AMS	Notebooks	336
052	AMS	Notebooks	476-477
336	APS Technologies	Hard Drives/Storage/TapeBackup	445
	Arlington Computer Products	Mail Order	472-473
	AT&T	AT&T GIS PCs	208-209
012	Austin Direct	Austin Notebooks & Desktops	200-201
	Austin Direct	Austin Notebooks & Desktops	203
	Compaq Computer Corporation	Notebooks	106-107
	Compaq Computer Corporation	Desktops	170-171
144	CompUSA Direct	Mail Order	480-481
360	COMPUTER DISCOUNT WAREHOUSE	Resellers	460-461
109	COMPUTER DISCOUNT WAREHOUSE	Resellers	462-463
159	COMPUTER DISCOUNT WAREHOUSE	Resellers	464-465
331	Creative Computers	Mail Order	344-345
329	CTX	CTX Notebooks	198
201	DTK Computer Incorporated	Systems	338
014	First Source International	Memory Software, Notebooks	456-457
089	FOSA Computer Inc.	Portables	455
	Gateway 2000	Mail Order	484-49
	IBM Corporation	ThinkPad 701c	126-127
	IBM Corporation	PC 300	128-129
219	Insight Direct	Mail Order	486-487
187	Insight Direct	Mail Order	488-489
027	Insight Direct	Mail Order	534
083	Magitronic	Magitronic Desktop System	454
138/391	Micro Mail Direct	Memory PCMCIA, Fax/Modem, LAN	372-373
010	Midwest Computer Works	Mail Order	478-479
	PC Connection	Mail Order	484-485
238	PCs Complete	Mail Order	467
092	PCs Complete	Mail Order	468-469
268	PCs Complete	Mail Order	470-471
053	PerComp Microsystems, Inc.	Mail Order	434-435
056	Pro Direct	Mail Order	433
086	Reveal Computer Products	Reveal MM	538-539
081	Sunshine Computers	Notebooks/Laptops	446
166	TechWorks	Graphic Accelerators/PCMemory	475
210	USA Flex	Desktop PCs	423-425
051	USA Flex	Desktop PCs	426-427
065	USA Flex	Desktop PCs	428-429
079	USA Flex	Desktop PCs	430-431
038	Zeos Int'l	Zeos AMBRA Server	88
151	Zeos Int'l	Mendian Color Notebooks	113-116
155	Zeos Int'l	Zeos Panthera Pentium PCs	191-196
MASS STORAGE			
052	APS Technologies	Storage	445
018	MegaHaus	Drives/Storage	490
309	S.A.G./Storage Solutions	Storage Solutions	319
271	Seagate Technology	Hard Drives	300
MEMORY			
009	Connectix	RAM Doubler for Windows	399
014	First Source International	Memory Software, Notebooks	456-457
075	First Source International	Notebooks, Memory, Peripherals	458-459
283	Future Micro	Memory	377
106	Kingston Technology	Processor Upgrades	271
019	L.A. Trade	Memory	452-453
069	Landmark	MagnaRAM for Windows	233
138/391	Micro Mail Direct	Memory	372-373
203	Micron Computer Inc.	Micron Memory	482
056	Pro Direct	Mail Order	433
166	TechWorks	PC Memory	475
239	Viking Components	Memory	92
MICRO-MAINFRAME LINKS			
	Microsoft	Microsoft Back Office	288-289
MISCELLANEOUS			
340	Anthro Technology	Computer Furniture	382
317	Microfield Graphics Inc.	Electronic Whiteboard	380
140	Proxima	TBO	68
MODEMS			
120	Hayes Microcomputer Products	Practical Peripherals	5
136	Hayes Microcomputer Products	Optima PCMCIA Modem	211
325	Microcom	Modems	384-385
056	Pro Direct	Mail Order	433
248	Simple Technology	PC Cards	189
311	Supra Corporation	26.6 Modems	370
920	US Robotics Inc.	Courier	36
	US Robotics Inc.	Sportster V 34	218-219
	US Robotics Inc.	Sportster V 34	221-224
856	US Robotics Inc.	Total Control	NE7
MULTI-MEDIA			
007	Connectix	QuickCam for Windows	325
073	Corel Corporation	CD Office Companion	261
322	Corel Corporation	CD Creator	293
023	Corel Corporation	Draw 3.4.5	313
037	Corel Corporation	Movie Guide	541
176	Diamond Multimedia Systems	Stealth 64	287
	Epson America	EPSON ES 1000C Scanner	10-11
062	Hartford Computer Group	Mail Order	449
219	Insight Direct	Multimedia	486-487
167	Insight Direct	Multimedia	488-489
027	Insight Direct	Multimedia	534
290	Media On	Multimedia PCs	376
018	MegaHaus	Drives/Storage	490
177	MPC Technology Inc.	Multimedia Notebooks	466
259	Number Nine Computer Corporation	771 Graphics Accelerator	278
324	Play Inc.	Snappy	354
086	Reveal Computer Products	Reveal MM	538-539
248	Simple Technology	PC Cards	189
071	Sony Computer Peripherals	Monitors	157
071	Sony Computer Peripherals	Monitors	157
118	View Sonic	Monitors	306-307
MULTIMEDIA SOFTWARE			
042	Corel Corporation	Wild Board Games	26
073	Corel Corporation	CD Office Companion	261
322	Corel Corporation	CD Creator	293
023	Corel Corporation	Draw 3.4.5	313
037	Corel Corporation	Movie Guide	541
026	Visual Software	Double Vision	4
MULTITASKING SOFTWARE			
300	Ability Plus Software	Ability Windows	346
	Microsoft	Microsoft NT Server	NE42-NE43
NETWORK INTERFACE CARDS			
	Hewlett Packard	HP 10Base-T Hubs	NE32-NE33
	Intel Corporation	Intel Adapters	NE11
	Standard Micro Systems	Fast Ethernet Card	347
	Standard Microsystems Corporation	Tiger Stacking Hubs	NE52
NETWORKING SOFTWARE			
254	Artisoft Inc.	LANtastic 6.0	26-27
861	FTP Software Inc.	Explore on Net	NE51
870	Funk Software	Remote Access Software	NE12
	IBM Corporation	Networking	NE28-NE29
	Microsoft	Microsoft Back Office	288-289
	Microsoft	Microsoft NT Server	NE42-NE43
	Novell Inc.	Novell Netware 4.1 Upgrade	NE8-NE9
	Oracle Corp.	Workgroup 2000	NE16-NE17
867	Performance Technology	Instant Internet	NE56
928	Perle Systems	Perle B33-Remote Access Server	NE48
904	Quarterdeck Office Systems	QEMM	309
923	RAD Data Communications	LAN & WAN Products	NE35
854	Russell Information Sciences	Calendar Manager	NE5
	WRQ	Reflection Suite for TCP	NE31
OCR PRODUCTS			
245	Caere Corporation	WordScan	90
	Epson America	EPSON ES 1000C Scanner	10-11
ON LINE DATABASE			
277	America Online	America Online	282A-B, 536A-B
050	California Software	InterApp	366
	Delphi Internet Services	Internet Mail Gateway	542
	Prodigy Services Co.	Prodigy On-Line Service	249-250
OPERATING SYSTEMS			
254	Artisoft Inc.	LANtastic 6.0	26-27
	Microsoft	Microsoft Windows95	16-17
	Microsoft	Microsoft Windows95	52-53
	Microsoft	Microsoft Windows95	86-87
	Microsoft	Microsoft Back Office	288-289
	Microsoft	Microsoft NT Server	NE42-NE43
	Novell Inc.	Novell Netware 4.1 Upgrade	NE8-NE9
OPTICAL PERIPHERALS			
018	MegaHaus	Drives/Storage	490
098	Pinnacle Micro	Optical Drives	43

RS#	Company	Product	Page#
ORGANIZATIONAL SOFTWARE			
854	Russell Information Sciences	Calendar Manager	NE5
OS/2 SOFTWARE			
	IBM Corporation	Networking	NE26-NE29
PC ACCESSORIES			
859	Micro Solutions Computer Products	Back-up 800-T	450
855	Micro Solutions Computer Products	Back-up 800-T	451
140	Proxima	TBO	68
PC DIRECT			
235	AMS	Notebooks	476-477
052	APS Technologies	Hard Drives/Storage/TapeBackup	445
336	Arlington Computer Products	Mail Order	472-473
144	CompUSA Direct	Mail Order	480-481
360	COMPUTER DISCOUNT WAREHOUSE	Resellers	460-461
109	COMPUTER DISCOUNT WAREHOUSE	Resellers	462-463
159	COMPUTER DISCOUNT WAREHOUSE	Resellers	464-465
354	Ergo Computing, Inc.	Thunderbolt Desktops	474
014	First Source International	Peripherals Software Notebooks	456-457
075	First Source International	Notebooks, Memory Peripherals	458-459
089	FOSA Computer Inc.	Portables	455
062	Hartford Computer Group	Mail Order	449
219	Insight Direct	Mail Order	486-487
167	Insight Direct	Mail Order	488-489
027	Insight Direct	Mail Order	534
019	L.A. Trade	Memory	452
083	Magitronic	Magitronic Desktop System	454
018	MegaHaus	Drives/Storage	490
138/391	Micro Mail Direct	Memory PCMCIA, Fax/Modem, LAN	372-373
859	Micro Solutions Computer Products	Back-up 800-T	450
855	Micro Solutions Computer Products	Back-up 800-T	451
203	Micron Computer, Inc.	Micron Memory	482
010	Midwest Computer Works	Mail Order	478-479
177	MPC Technology Inc.	Multimedia Notebooks	466
	PC Connection	Mail Order	484-485
238	PCs Complete	Mail Order	467
092	PCs Complete	Mail Order	468-469
268	PCs Complete	Mail Order	470-471
053	PerComp Microsystems, Inc.	Mail Order	434-435
056	Pro Direct	Mail Order	433
278	Samsung	Samsung Notebooks	132-133
043	SPSS Inc.	Statistical/Windows Software	483
081	Sunshine Computers	Notebooks/Laptops	446
021	SYS Technology	PCs and Peripherals	447
168	TechWorks	Graphic Accelerators/PCMemory	475
210	USA Flex	Desktop PCs	423-425
051	USA Flex	Desktop PCs	426-427
065	USA Flex	Desktop PCs	428-429
079	USA Flex	Desktop PCs	430-431
PCMCIA			
117	Adaptec	SCSI Adapter/Portables	109
075	First Source International	Notebooks Memory Peripherals	458-459
120	Hayes Microcomputer Products	Practical Peripherals	5
136	Hayes Microcomputer Products	Optima PCMCIA Modems	211
138/391	Micro Mail Direct	Fax/Modem, Flash SRAM, Drives	372-373
248	Simple Technology	PC Cards	189
920	US Robotics Inc.	Courier	36
	US Robotics Inc.	Sportster V 34	218-219
	US Robotics Inc.	Sportster V 34	221-224
856	US Robotics Inc.	Total Control	NE7
PERIPHERAL SHARING DEVICE			
	Hewlett Packard	HP Jet Direct	214
150	SmartPrint/Dresselhaus	SmartPrint	323
PERIPHERALS			
078	AGFA	Scanners	96
187	Canon U.S.A.	Multipass 1000	235
360	COMPUTER DISCOUNT WAREHOUSE	Peripherals	460-461
109	COMPUTER DISCOUNT WAREHOUSE	Peripherals	462-463
159	COMPUTER DISCOUNT WAREHOUSE	Peripherals	464-465
007	Connectix	QuickCam for Windows	325
086	Creative Labs	SoundBlaster	0
176	Diamond Multimedia Systems	Stealth 64	287
	Epson America	EPSON ES 1000C Scanner	10-11
014	First Source International	Peripherals Software Notebooks	456-457
075	First Source International	Notebooks Memory Peripherals	458-459
	Gateway 2000	Peripherals	145-148
	Gateway 2000	Peripherals	484-49
120	Hayes Microcomputer Products	Practical Peripherals	5
136	Hayes Microcomputer Products	Optima PCMCIA Modem	211
219	Insight Direct	Peripherals	486-487
167	Insight Direct	Peripherals	488-489
027	Insight Direct	Peripherals	534
398	Midwest Micro	Peripherals	437-443
015	Philips	Monitors	98-99
324	Play Inc.	Snappy	354
884	OMS	Magicolor Printer	NE27
021	SYS Technology	PCs and Peripherals	447
210	USA Flex	Printer Accessories	423-425
POWER PROTECTION			
162	American Power Conversion	Back-UPS	152
080	PC Power & Cooling	PowerProtect on& Cooling Devices	63
PRESENTATION SOFTWARE			
322	Corel Corporation	CD Creator	293
	Microsoft	Microsoft Powerpoint	C2.1
PRINTER ACCESSORIES			
150	SmartPrint/Dresselhaus	SmartPrint	323
210	USA Flex	Peripherals	423-425
051	USA Flex	Peripherals	426-427
065	USA Flex	Peripherals	428-429
079	USA Flex	Peripherals	430-431
PRINTERS			
	Apple Computers	Cobra Laserwriter	122-123
332	Brother International	Fax/Printers	388
	Canon Computer Systems	Canon BJC-70 Printer	64-65
187	Canon U.S.A.	Multipass 1000	235
227	Data Products Corporation	Printers	231
014	First Source International	Peripherals Software Notebooks	456-457
301	General Parametrics	Spectra Star	381
	Hewlett Packard Peripheral Group	HP LaserJet Printers	139
	Hewlett Packard Peripheral Group	HP LaserJet Printers	259
328	Lumina	Series 2000 Printer	353
	Olivetti	OL 810e	242
	Olivetti	400 Printers	402
884	OMS	Magicolor Printer	NE27
081	Sunshine Computers	Notebooks/Laptops	446
001	Tektronix Inc.	Tektronix Printers	74
210	USA Flex	Printers	423-425
051	USA Flex	Printers	426-427
065	USA Flex	Printers	428-429
079	USA Flex	Printers	430-431
163	Xerox Corporation	Xerox 4900	409
PROGRAM DEVELOPERS			
348	Computer Associates	Visual Objects	2.3
	Microsoft	Microsoft Back Office	288-289
	Microsoft	Microsoft Visual Fox Pro	NE14-NE15
PROGRAMMERS TOOLS UTILITIES			
348	Computer Associates	Visual Objects	2.3
	Microsoft	Microsoft Back Office	288-289
	Microsoft	Microsoft Visual Fox Pro	NE14-NE15
PROJECT MANAGEMENT			
249	AEC Software	Fast Track Schedule	341
148	Primavera Systems	SureTrak	45
	Sorcor Corporation	Project Scheduler 6	84
REMOTE COMPUTING			
032	Crosstalk/Attachmate	Crosstalk for Windows	275
299	McAfee Associates, Inc.	NetRemote	305
356	Motorola	Envoy Marco Wireless Commun	24-25
928	Perle Systems	Perle B33-Remote Access Server	NE46
923	RAD Data Communications	LAN & WAN Products	NE35
061	STAC Electronics	ReachOut	291
920	US Robotics Inc.	Courier	36
	US Robotics Inc.	Sportster V 34	218-219
	US Robotics Inc.	Sportster V 34	221-224
856	US Robotics Inc.	Total Control	NE7
211	Xircom	Netwave	266-267
RENTALS/LEASING			
062	Hartford Computer Group	Mail Order	449
RESELLERS			
083	Magitronic	Magitronic Desktop System	454
018	MegaHaus	Drives/Storage	490
010	Midwest Computer Works	Reseller	478-479
081	Sunshine Computers	Notebooks/Laptops	446
SCANNERS			
078	AGFA	Scanners	96

Windows 95

Operating Systems, Side by Side

We'll also take a comparative look at each environment's features, interface, architecture, networking capabilities, and bundled applications.

Windows 95 Tips and Tricks

Our Windows gurus have been exploring the ins and outs of Windows 95 for months. They're ready to share their secrets for upgrading to Windows 95, navigating the new interface, and getting it to work on network installations. Also included: where to go for support, and top Windows 95 time-savers. If you opt to move to Windows 95, we'll help you get up and running fast.

Windows 95 Applications Preview

Right behind Windows 95 is a flood of new software that takes advantage of Windows 95's new interface and its 32-bit underpinnings. We'll preview dozens of applications—in categories ranging from office suites to utilities to graphics—designed specifically to run under Windows 95.

PC Tech

Microsoft Visual Basic, with its high-level language and its paint-box approach to interface building, completely revolutionized Windows programming. Now, Borland's Delphi takes the paradigm a major step forward by adding full object orientation and a true compiler. Stephen Plain tests and compares these two classic rapid application development (RAD) tools.

Other PC Tech highlights include a look at Windows 95's enhanced serial-communications capabilities and a tour of the OS/2 Workplace shell.

For ADDITIONAL Cataloging see **MARKETPLACE PRODUCT INDEX**, page 497

Editorial Product Index

Reader Service No.	Product	Company	Page
521	AccessBuilder 2000	3Com Corp	323
523	Ace for Windows, Version 3.0	Santa Fe Software	251
524	ACT! 2.0 for Windows	Symantec Corp.	252
465	ActionNote 880CX	Epson America Inc.	167
525	Action Plus Software for Windows 1.51	Action Plus Software Inc.	254
538	Adobe Photoshop Handbook	Random House Electronic Publishing	69
413	Advanced Turbo Browser 4.0	Pacific Gold Coast Corp.	54
453	ARMNote TS30MC	ARM Computer Inc.	125
453	ARMNote TS30PH	ARM Computer Inc.	125
455	Ascentia 910N	AST Research Inc.	149
455	Ascentia 950N	AST Research Inc.	149
456	AstroNote SKD III	Astro Research Inc.	149
433	Austin PowerPlay 604/100	Austin Computers	37
964	Axis 851/951 Network CD-ROM Server	Axis Communications Inc.	NE48
493	Bioforge	Origin Systems	535
970	BrightWorks 2.01	McAfee Associates Inc.	NE34
415	Britannica CD (Version 1.0)	Encyclopaedia Britannica Inc.	54
459	BSI NP7657D	Broadax Systems Inc.	154
459	BSI NP7659T	Broadax Systems Inc.	154
459	BSI NP9549D	Broadax Systems Inc.	154
444	Canon BJC-70	Canon Computer Systems Inc.	225
434	Canon PN-100	Canon Information Systems	40
501	Carbon Copy for Windows 2.5b	Microcom Inc.	282
955	CD-System	SciNet	NE26
402	Chief Architect 3.0	Advanced Relational Technology Inc.	56
512	Cisco 2509 Access Server	Cisco Systems Inc.	308
965	Cisco 2517 Router/Hub	Cisco Systems Inc.	NE47
445	Citizen PN60	Citizen America Corp.	228
410	ClickFlick 1.0	MiraTech	56
502	Close-Up 6.0	Norton-Lambert Corp.	283
469	ColorBook? DX4/100	Gateway 2000 Inc.	184
526	Commence 3.0 Personal Information Manager	Jensen Jones Inc.	257
503	CoSession for Windows 2.0g	Triton Technologies Inc.	283
966	CU-SeeMe	White Pine Software Inc.	NE50
494	The Daedalus Encounter	Virgin Interactive Entertainment	535
446	DECwriter 90ip	Digital Equipment Corp.	230
430	Dell Latitude XPi P90	Dell Computer Corp.	38
497	Descent	Interplay Productions Inc.	540
538	Designer Photoshop	Random House Electronic Publishing	69
956	DiscPort Pro	Microtest Inc.	NE26
954	DiscPort Tower	Microtest Inc.	NE25
423	Encore, Version 4.0	Passport Designs	66
414	Encyclopedia Americana	Grolier Electronic Publishing Inc.	54
962	Express Meter 3.0	Express Systems Inc.	NE48
962	Express Meter Audit Kit 3.0	Express Systems Inc.	NE48
461	EzBook	CTX International	156
468	FutureMate FM309T	FutureTech Systems Inc.	182
468	FutureMate FM559D	FutureTech Systems Inc.	182
511	Gator Access MP	Cayman Systems Inc.	304
457	Globalyst 130	AT&T Global Information Solutions	153
457	Globalyst 200S	AT&T Global Information Solutions	153
457	Globalyst 250P	AT&T Global Information Solutions	153
527	GoldMine for Windows 2.5a	ELAN Software Corp.	260
401	GoPrint	AeroComm Inc.	56
464	HiNote CT475	Digital Equipment Corp.	160
464	HiNote Ultra CT475	Digital Equipment Corp.	160
449	HP DeskJet 320	Hewlett-Packard Co.	232
972	HP JetDirect EX Plus3	Hewlett-Packard Co.	NE40
470	HP OmniBook 4000CT	Hewlett-Packard Co.	186
419	HP Vectra XM Series 3	Hewlett-Packard Co.	61
537	The HTML Sourcebook	John Wiley & Sons	69
471	HyperBook 900A	HyperData Technology Corp.	186
498	The Incredible Machine 2	Sierra On-Line	543
460	Innova Book 200LS IB100/520LS	Canon Computer Systems Inc.	154
971	Intel ProShare Video System 200, Version 1.8	Intel Corp.	NE25
427	Internet in a Box, Version 2.0	CompuServe Inc./SPRY Internet Division	66
959	Internet NOW	Pacific Bell	NE47
960	Internet Office 4.0	CompuServe Inc./SPRY Internet Division	NE47
435	InvisiView	Man & Machine Inc.	39
528	Janna Contact, Version 2.0	Janna Systems Inc.	263
420	Jaz	Imega Corp.	62
495	Jewels of the Oracle	Discis Knowledge Research Inc.	536
500	Johnny Mnemonic	Sony Imagesoft	543
504	KopyKat 1.1	Hilgraeve Inc.	286
963	KSA	Intrusion Detection Inc.	NE48
514	LANA/4e	LAN Access Corp.	310
513	LAN Distance Connection Server	IBM Corp.	308
515	LANexpress 4000	Microcom Inc.	315
518	LanRover/E PLUS 3.5	Shiva Corp.	318
505	LapLink for Windows 5.0a	Traveling Software Inc.	290
462	Latitude 475C	Dell Computer Corp.	156
462	Latitude XP4100CX	Dell Computer Corp.	156
469	Liberty DX4/100	Gateway 2000 Inc.	184
426	LiveShare Plus	PictureTel Corp.	62
529	Maximizer 3.0 for Windows	Modatech Systems International	269
517	MBE-RAS	RAD Data Communications Inc.	316
463	MediaBook 5110T	DFI	160
473	MediaNote	Maximus Computers Inc.	188
452	MediaPro	AMS Inc.	121
452	MediaPro II	AMS Inc.	121
491	Meridian 850A	ZEOS	213
491	Meridian 850C	ZEOS	213
475	Micro Express NP92DX4	Micro Express	190
516	MiniArray Turn-Key Communications Server MABER/HD	Multi-Tech Systems Inc.	316
447	MobileJet	Mannesmann Tally Corp.	230
477	MPC CD-Book	MPC Technologies Inc.	197
477	MPC TouchNote	MPC Technologies Inc.	197
418	Multimedia Soundpad	Futuretouch Corp.	61
429	Multia	Digital Equipment Corp.	46
520	NetBlazer PN4DE	Telebit Corp.	321
969	Norton AntiVirus for NetWare 2.0	Symantec Corp.	NE40
506	The Norton pcAnywhere 2.0 for Windows	Symantec Corp.	292
492	NoteMaster S3945T	Samsung Electronics America Inc.	202
479	Nova OpenNote	Novacor Inc.	199
448	Olivetti JP50	Olivetti Office USA	230
406	OmniForm	Caere Affiliate Publishing	42
416	PageMaker 6.0	Adobe Systems Inc.	61
480	Panasonic V41	Panasonic Personal Computer Co.	199
405	PartitionMagic for OS/2, Version 1.02	PowerQuest Corp.	51
951	PCBoard v15.21	Clark Development Co. Inc.	NE13
422	Pioneer DRM-624X	Pioneer New Media Technologies Inc.	62
450	PocketJet	Pentax Technologies Corp.	240
507	PolyPM/2.3.0	Software Corp. of America	294
466	PowerBrick 50	Ergo Computing Inc.	182
412	PowerControl 2.0	SoftMagic Corp.	44
473	PowerMax	Maximus Computers Inc.	188
411	Power 100	Power Computing Corp.	48
403	RAM Doubler for Windows	Connectix Corp.	44
508	ReachOut 5.0 for Windows & DOS	Stac Electronics Inc.	295
958	Redwood	Banyan Systems Inc.	NE48
522	Remote Annex 2000	Xylogics Inc.	325
519	Remote Office Communications Server	Stampede Technologies Inc.	318
509	Remote Possible/Dial 4.0	Avalan Technology Inc.	296
424	Remove-IT 2	Vertisoft Systems Inc.	61
510	RLN Turnkey Server	Attachmate Corp.	303
968	Saber LAN Workstation 5.0b	Saber Software Corp.	NE36
481	Sager NP7659T	Sager Midem Computer Inc.	202
481	Sager NP9549A	Sager Midem Computer Inc.	202
485	Satellite T2100CS	Toshiba America Information Systems	206
485	Satellite T4900CT	Toshiba America Information Systems	206
967	Satellite Pro T2150CDT	Toshiba America Information Systems	206
492	S-Bridge NT for Microsoft Mail	Computer Mail Services Inc.	NE50
483	SENS700	Samsung Electronics America Inc.	202
483	Sharp PC-3050	Sharp Electronics Corp.	204
483	Sharp PC-8900	Sharp Electronics Corp.	204
488	ShowBIZ	Wedge Technology Inc.	210
488	ShowBook EL	Wedge Technology Inc.	210
488	ShowBook P5	Wedge Technology Inc.	210
486	Slimnote 5100C	Twinhead Corp.	207
486	Slimnote 5100T	Twinhead Corp.	207
476	SoundBook Plus	MidWest Micro	190
476	SoundBook II	MidWest Micro	190
482	SoundX Series 3000 Pentium 75	Sceptre Technologies Inc.	204
482	SoundX Series 3000 Pentium 90	Sceptre Technologies Inc.	204
458	Steplite Notebook	Austin Direct	153
467	StepNote D100	Everex Systems Inc.	182
467	StepNote P75	Everex Systems Inc.	182
466	SubBrick 75	Ergo Computing Inc.	182
530	SuperOffice 3.0	SuperOffice Corp.	270
404	Symantec C++ 7.0	Symantec Corp.	50
408	Systat 6.0 for DOS	SPSS Inc.	47
531	TeleMagic Enterprise for Windows 1.5	TeleMagic Inc.	272
421	ThinFax 1414LXM	EXP Memory Inc.	62
472	ThinkPad 360CSE	IBM Personal Computer Co.	186
472	ThinkPad 701C	IBM Personal Computer Co.	186
472	ThinkPad 755CD	IBM Personal Computer Co.	186
472	ThinkPad 755CX	IBM Personal Computer Co.	186
540	Timbuktu Pro for Windows	Farallon Computing Inc.	299
484	Ti TravelMate 4000M/50 Dual Scan Color	Texas Instruments	206
484	Ti TravelMate 5000 75MHz Pentium TFT	Texas Instruments	206
431	Ti TravelMate 5000 90MHz Pentium TFT	Texas Instruments	38
417	ToolVox	VoxWare Inc.	61
432	Toshiba Portégé 610CT	Toshiba America	37
532	Tracker for Windows 2.0	Tracker Software Inc.	274
487	Travel Asset	Unisys Corp.	207
487	Travel Partner	Unisys Corp.	207
452	TravelPro 350C	AMS Inc.	121
957	TribeLink2	Tribe Computer Works	NE47
407	UnInstaller 3	MicroHelp Inc.	42
454	Universa-CD	Aspen Computer Inc.	125
478	Versa P/75	NEC Technologies Inc.	197
478	Versa V/50	NEC Technologies Inc.	197
451	Virage II DX4/100	Altima Systems Inc.	117
451	Virage II 486DX2/50	Altima Systems Inc.	117
458	Vista Notebook	Austin Direct	153
409	Vizion, Version 1.1	SIRSI Corp.	47
496	Voyeur	Interplay Productions Inc.	536
961	Watcher II	Caravelle Networks Corp.	NE47
957	WebManage	Tribe Computer Works	NE47
952	Wildcat! 4.1	Mustang Software Inc.	NE16
428	WinFax Scanner	Delrina Corp.	66
425	WIN'95 Advisor	TouchStone Software Corp.	66
533	WinSales, Version 2.1	WinSales Inc.	275
953	Worldgroup Version 1.0	Galacticomm Inc.	NE17
489	XP DX4-100 16/520 Dual-Scan Color	WinBook Computer Corp.	212
489	XP DX4-100 32/810 TFT	WinBook Computer Corp.	212
499	Xplora 1: Peter Gabriel's Secret World	Interplay Productions Inc.	536
474	YesBook X-740C	MaxTech Corp.	190
474	YesBook X-740T	MaxTech Corp.	190
490	Z-Noteflex	Zenith Data Systems	212
490	Z-Star EX	Zenith Data Systems	212

NE—Network Edition.

To obtain the Network Edition of *PC Magazine*, call Circulation at 800-289-0429.

After Hours

EDITOR'S RATINGS: ★ Poor ★★ Fair ★★★ Good ★★★★ Excellent

CD-ROM Windows CD-ROM Resource-Intensive Adult Content Kids (Ages) Price

Hot Adventures or Cool Movies: You Decide

These days, there's no such thing as a simple adventure game. One gamer's interactive movie is another gamer's adventure game. Video footage, photo-realistic graphics, and challenging puzzles distinguish these four games from the rest of the pack.

Nothing here is as simple as getting from one location to another. Each game adds its own twist to the standard adventur-

ing fare. *Voyeur* adds a compelling real-world story line to its video game play, while *Jewels of the Oracle* presents puzzle-solving without a linear story line. *BioForge* adds futuristic carnage to the mix, while *The Daedalus Encounter* relies on the appeal of star power to lure you into the action. With all of these enticing options, you can see why adventure games are hotter than ever.

BioForge

Origin Systems Inc.,
800-245-4525.

Circle 493 on reader service card

★★★★★ CD-ROM Resource-Intensive Adult Content Kids (Ages) Price

BioForge blends a cyberpunk science-fiction story line with an action-adventure game. At the start of the action, your character finds himself cybernetically enhanced but locked in a research station that has been commandeered by a mad scientist. After he escapes from

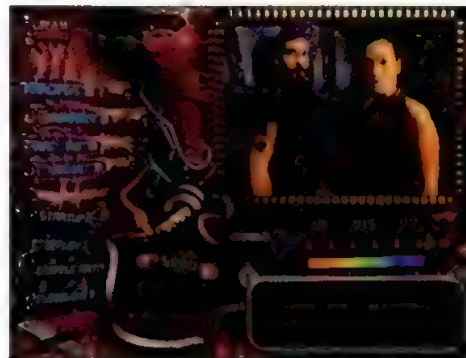
his prison cell, he must figure out what happened to the scientist and dispense with the alien civilization buried beneath the planet's surface.

You move your character around on-screen and watch him run, jump, duck, and—most important—punch, kick, and shoot. The animation is modeled after actual human movement, so actions are smooth and very lifelike. The real-time combat is sure to test your reflexes; gamers looking for a thoughtful, *Myst*-like adventure should look elsewhere. The graphics have a dark, Gothic edge to them, and the music is atmospheric.

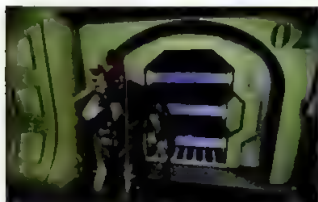
Origin Systems calls *BioForge* an interactive movie, and the game has enough of a science-fiction plot to reinforce that claim. It also has a cine-

matic feel, thanks to the constantly shifting camera angles. But sometimes the shifts are too abrupt; just as you're about to kill off an opponent, for example, the camera angle changes and your chance is lost. And it seems as though the game ends just as you're getting involved in the world. As an interactive movie, *BioForge* is more of a short rather than a feature-length film—but at least it's fun.

—Bernard H. Yee



In *The Daedalus Encounter*, you must try to find a way to steer the alien craft away from the sun.



Explore and fight your way through *BioForge*.

but-tough commanding officer, and Zack (played by someone you've never heard of), a rebel-without-an-original-line. In these postcombat days, you've all become intergalactic junk dealers.

En route to one of your first missions, the ship crashlands on an alien craft that's hurtling toward the sun. You must help your surprisingly accident-prone pals explore the strange craft, avoid the flying piranhalike Krill that infest its corridors, and steer the ship clear of harm's way. You follow your companions' journey using the ship's small probe, which allows you to analyze objects and shoot the occasional laser.

The Daedalus Encounter

Virgin Interactive Entertainment,
800-874-4607.

Circle 494 on reader service card

★★★★★ CD-ROM Resource-Intensive Adult Content Kids (Ages) Price

In this superior follow-up to the critically blasted *Critical Path*, you play Casey O'Bannon, gunner in the First Interstellar War of 2135. You fight alongside your friends Ariel (played by Wayne's World babe Tia Carrere), a beautiful-

AFTER HOURS INDEX

Adventure Games

BioForge.....535

The Daedalus Encounter.....535

Jewels of the Oracle.....536

Voyeur.....536

CD-ROM Pick Hit

Xplora I: Peter Gabriel's

Secret World.....536

Action

Descent.....540

Quick Clips

The Masters

Palmtree Interactive CD

Stephen Blickenstaff's

ScreamSavers

Triazle.....540

Spotlight on Adventure

Johnny Mnemonic.....543

Video

The Incredible Machine 2.....543

After Hours

The game consists of a series of QuickTime Movies. Your part in the action tends toward trying to figure out how to open a door or shoot Krill before they can sink their dentures into our cybercelebs. With three difficulty settings, multiple endings, and a help system that tells you a puzzle's goal (but not its answer), the game offers mind-bender fans plenty to pacify their enigmatic longings. But die-hard gamers will probably be turned off by the extreme lack of game play.

—Shane Mooney

Jewels of the Oracle

Discis Knowledge Research Inc., 416-250-6537.

Circle 495 on reader service card

★★★★★

You are about to enter the mysterious city of Nisus, the center of an ancient civilization that predates the Egyptians, Greeks, and Sumerians. In order to gain entrance, you must first solve a series of challenging puzzles designed to test your logic and reasoning skills.

This is Jewels of the Oracle, a new Windows-based adventure game that is similar to Myst and The 7th Guest but with a style and design all its own. Your quest is to recover 24 gems and return them to the Altar Room. You recover each gem by solving a corresponding

PROBLEM SOLVER

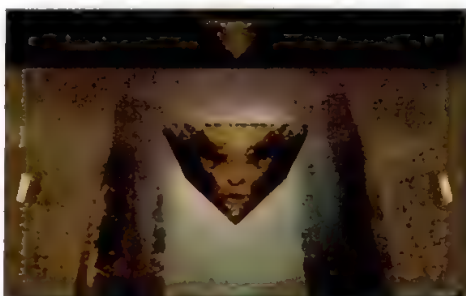
• The problem solver is a new feature.

If you're going to play more than an occasional adventure game, you'll want to invest in some serious hardware. The motion video and realistic sound effects that make these games fun demand a powerful processor, a video card with at least 1MB of RAM, and a wavetable audio card to get the full effect.

puzzle. Along the way, you will receive hints from the Oracle, which is embodied by a triangular stone at the top of your screen. But be warned: The Oracle's hints can be cryptic, and they are not always particularly helpful.

One of the game's strengths is that it doesn't have a linear story line. Unlike most other adventure games, in which you must solve puzzle A before moving on to puzzle B, Jewels gives players access to all 24 puzzles. Jewels lets you take on each puzzle in either Easy or Hard mode, rather than locking you into one or the other for the entire game. You can even "refuse" a puzzle and get your jewel the easy way, but you won't see the same game ending if you do so.

The game's photo-realistic graphics are so detailed you'll feel as though you've actually been on an archaeological dig. The musical score is equally impressive, as are the sound effects.



You may not want to believe everything Jewels of the Oracle's hint-giver tells you.

This is a spectacular journey into an ancient civilization and a puzzle fan's dream come true.

—Michael Ryan

Voyeur

Interplay Productions Inc., 800-969-4263.

Circle 496 on reader service card

★★★★★

Politics is a dirty business, and nowhere is it dirtier than in Voyeur. Reed Hawke is considering a run for the presidency. But something is rotten at Hawke Manor, and it's your job to record incriminating evidence and put an end to Hawke's political aspirations.

Starting from an outside view of Hawke Manor, you aim your video camera into the 15 or so windows and look for a Listen, Evidence, or Scene icon. When an icon appears, you click on that window and eavesdrop on a conversation, zoom in and examine personal documents and belongings, or watch or listen to a short scene. The game starts at 4:00 Saturday afternoon, and you have until 10:30 Sunday night to obtain the evidence you need and



Watch carefully as the video action unfolds in Voyeur.

show it to the police.

The game is divided into several time slots. While you are in any one of them, you have approximately 3 minutes to snoop around. The catch is that while the 3-minute clock is running, the scenes are playing themselves out, regardless of whether you're watching, so it is important to focus on getting the evidence.

The first few times you play, you will be impressed with the well-rendered mix of high-quality graphics and live video. But after you see the same scenes play over and over, the game becomes tedious.

—Richard Brown

Peter Gabriel's Xplora 1

Whether he was forging new rock-and-roll territory as a member of the band Genesis, incorporating world-music styles in his solo work, or creating groundbreaking videos, Peter Gabriel has always been at the vanguard. Xplora 1: Peter Gabriel's Secret World is yet another original effort.

Unlike other CD-ROMs from musicians trying to jump on the multimedia bandwagon, Gabriel's Xplora 1 is not simply a game or a recounting of the artist's discography. It's a varied and personal endeavor that includes Gabriel's own reflections on his music, short biographies of artists he's collaborated with, behind-the-scenes looks at the travails of

making music videos, and full-length versions of "Steam" and "Digging in the Dirt."

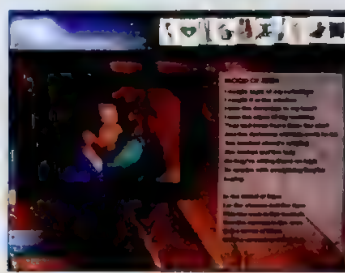
—John R. Quain

Interplay Productions Inc., 800-969-4263.

Circle 499 on reader service card

★★★★★

CD-ROM PICK HIT



Own a Modem?

Try America Online FREE

If you own a computer and a modem, we invite you to try the nation's most exciting online service, America Online®, FREE.



- ▲ Build a personal software library by downloading from a library of over 120,000 files—games, graphics, multimedia programs and more!
- ▲ Navigate the Internet with ease through the Internet Connection.
- ▲ Get computing support from industry experts at online conferences and through our computing forums.
- ▲ Plus, unlimited e-mail, news updates, financial information, and live nationwide access to an electronic community.

We'll send you the software and give you 10 FREE hours to try America Online—risk-free.

Simply complete and mail the form below, or call 1-800-213-8700 and ask for your free America Online Start-up Kit today!



**Detach &
Mail Today!**
Must respond by
8/31/95



Yes! I'd like to try America Online—FREE.

Send me the free software and trial membership. I understand there's no risk—if I'm not completely satisfied, I may cancel without further obligation.



NAME _____
ADDRESS _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
(HOME) PHONE _____

SELECT DISK TYPE AND SIZE —

Windows*: ☐ 3.5
Apple: ☐ Macintosh*
CD ROM: ☐ Macintosh* ☐ Windows*
Other: _____

* To use America Online for Windows, you must have a 386 PC or higher, 4MB of RAM, a VGA (256 color support recommended) monitor, a mouse, a modem and a working copy of Windows 3.1. Use of America Online requires a major credit card or checking account. Additional time on America Online is \$2.95 (US dollars) per hour. Users outside the US pay an additional per minute surcharge at all times, including trial time. Please use keyword ACCESS for further access information. Additional phone charges may apply. Your free trial must be used within 30 days of initial sign-on. Limit one free trial per individual. Must be 18 years or older. America Online is a registered service mark of America Online, Inc. Other names are service marks or trademarks of their respective owners.

ATTENTION MODEM OWNERS!

RESPOND BY 8/31/95

How Many of These America Online Services Could You Use Right Now?

- ▲ Issues of your favorite magazines online
- ▲ Free Internet access
- ▲ Up-to-date stock quotes and Morningstar Mutual Funds service
- ▲ Television networks and shows online
- ▲ Online software support and quick answers to questions



- ▲ Access to the latest U.S. and world news with Reuters®
- ▲ More than 120,000 software files and fast, easy downloading
- ▲ Multi-player graphic games
- ▲ Movie, video and game reviews
- ▲ Clubs, special interests, and hobbies

*See other side for details about your
FREE trial of America Online!*



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

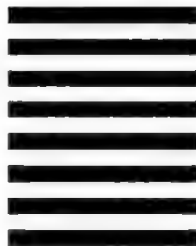
FIRST CLASS MAIL PERMIT NO. 9096 VIENNA, VA

POSTAGE WILL BE PAID BY ADDRESSEE

AMERICA

Online

8619 Westwood Center Drive
Vienna, VA 22182-9806



Return the card
or call
1-800-213-8700
and request your free
America Online
Start-up kit today!





FOR THOSE WHO CAN'T SEEM TO GET NETWORKING OFF THEIR MIND.

Consumed by the need to network? Then you really should attend NetWorld+Interop® this fall in Atlanta. You'll meet with over 500 of the industry's top LAN, WAN and telecommunications suppliers. You'll explore the world's most diverse, fully deployed event network, the InteropNet™, as it runs the latest in high-speed networking, client-server, Internet access and more. Best of all, you'll test drive new solutions vital

to your business and see how well they *really* work. NetWorld+Interop is, by far, the fastest, easiest way to check out all the hottest networking technologies. Not to mention the perfect place to improve how your business communicates. So don't wait another minute. Make your reservation for Atlanta right away.

NETWORLD+INTEROP 95

CIRCLE 355 ON READER SERVICE CARD

FREE VIP PASS • ATLANTA, GA • SEPTEMBER 27-29 • GEORGIA WORLD CONGRESS CENTER

Name _____ Company _____

Address _____ City, State, Zip _____

Phone/Fax _____ Fax: 415-525-0199 • Mail: N+I 95, P.O. Box 5855, San Mateo, CA 94402-0856

GET CONFERENCE INFORMATION VIA THE WEB AT <http://www.sbexpos.com> • QUESTIONS? CALL 800-488-2883

A400

The conference program runs September 25-29. Outside the U.S., call 415-578-8900. © 1995 SOFTBANK Exposition and Conference Company (SOFTBANK Expos). Interop is a registered trademark of SOFTBANK Expos. NetWorld is a service mark of Novell Inc. All other names are the property of their respective holders.



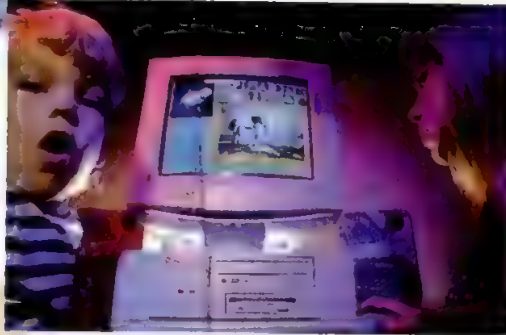
"We made our existing PC

zoom

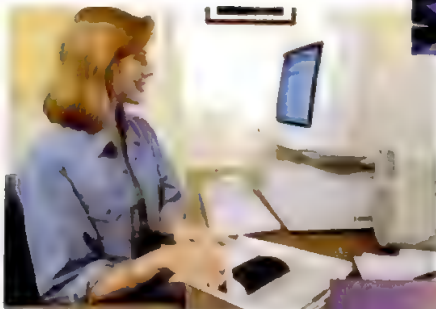


around the Internet,

run multimedia,



type



200 words a minute,

show us a

Who says you need a brand new computer to get things done? We're doing some pretty amazing stuff, just by adding a few affordable upgrades to the PC we already own.

3D world and



So while other folks are scrimping to pay for a new Tyrannosaurus XL Super Computer that really does *less* than ours, we're able to handle braces, ballet and college funds.



Reveal has over a hundred exciting upgrade products, available at most major computer retailers. To learn more about us, zoom over to our Web site at <http://www.reveal.com>



answer the phone on Sundays.

The other day, we watched a video of the Apollo moon landing with our multimedia encyclopedia. Incredible. My PC actually gave me goosebumps. What kind of people design this stuff?"

REVEAL™
THE POWER OF COMPUTER UPGRADING™
CIRCLE 086 ON READER SERVICE CARD



After Hours

Action

360° of War

Descent

Interplay Productions Inc.,
800-969-4263.

Circle 497 on reader service card

★★★★   

If you've spent any time on-line—or even watching television—during the past several months, chances are

you've heard of Descent. This 3-D action shoot-'em-up has garnered quite a lot of attention, and with good reason: There's never been a game like this before.

Your mission is simple. A horde of renegade robots has taken over the mines of Lunar Base I and is holding several humans hostage. Your job is to take out the robots and save the humans. Although it sounds easy enough, it's not so simple in practice. In fact,



Get ready for dizzying 3-D action in the shoot-'em-up world of Descent.

it's pretty tough just getting your bearings straight. Descent gives you a complete, 360-degree range of movement, which often leads to dizzying disorientation.

The graphics are very good,

QUICK CLIPS

Recommended
It's Your Call
Not Recommended

The Masters

Put on your green jacket and learn everything there is to know about the Augusta National golf course and the tournament that made it famous. Enough player stats to please any golf junkie. \$39.99; Creative Multimedia; 503-241-4351.

Palmistry Interactive CD

Explore your destiny the old-fashioned way—with a digital faux Greek goddess named Aliena, who will read your palm without even seeing it. Beautifully produced but not much use for divining the future. \$49.95; Emerald Entertainment; 714-494-4988.

Stephen Bickenstaff's ScreamSavers

If your idea of a good time is watching headless mutant monsters cavort across your monitor, you're in luck. The rest of us might prefer a less in-your-face After Dark-compatible screen saver. \$29.95; Binary Software; 800-824-6279.

Triazle

Solve these challenging geometric puzzles and the beautifully drawn rain-forest graphics start jumping and dancing. Best of all, some of the profits go to rain-forest conservation efforts. \$19.99; Berkeley System; 510-540-5535.

Click Click,

PC/Computing
How Computers Work
CD-ROM/Book extravaganza
from Ziff-Davis Press.

Click your way through an electrifying multimedia voyage to the heart of the computer with *How Multimedia Computers Work*—a unique CD-ROM packaged with the classic best-selling book *PC/Computing How Computers Work*.

In *How Multimedia Computers Work*, fun, fast-paced, fascinating tours of your computer's incredible innards combine state-of-the-art 3D animation with lively dialog and music for a



richly interactive sensory feast. Also included are provocative video interviews with well-known computer industry figures—plus tons of computing tips from the top authors at Ziff-Davis Press. Teamed up with a book that has already shown legions of computer users what makes their machine tick, *How Multimedia Computers Work* is a real whiz-bang experience that's sure to make you see your computer in a whole new light. Ask your favorite bookseller for *PC/Computing How Computers Work* with *How Multimedia Computers Work* on interactive CD-ROM.

BANG

Ziff-Davis Press books are available at all fine bookstores, or call 1-800-688-0448, ext. 226.



W H I Z



© 1994 Ziff Davis Press

HOW COMPUTERS WORK

INCLUDES INTERACTIVE CD-ROM



ISBN: 1-56276-250-8 Price: \$39.95

COREL

A must for all movie lovers!

ALL-MOVIE GUIDE

The Ultimate Guide to the Movies

COREL
CD-ROM

This multimedia movie expert gives you interactive access to the world's largest movie database on CD-ROM. You will enjoy hours and hours of entertainment exploring the glamorous world of movie stars, directors and behind-the-scenes cast in the Corel All-Movie Guide.

90,000
*movie and
video listings*

- ▶ Easy-to-use video store interface
- ▶ All facts are completely cross-referenced
- ▶ Purchase movies and videos online
- ▶ Assign your own movie rating
- ▶ Read descriptions and ratings of major motion pictures
- ▶ Test your movie knowledge in the Trivia Game or crossword puzzles

COMPARE THE COREL VALUE!	ALL-MOVIE GUIDE	CINEMANIA '95
FEATURE FILMS	45,000	17,000
VIDEOS AND TV MOVIES	45,000	2,500
INFORMATION ON CAST AND PERFORMERS	150,000	4,100
FOREIGN FILMS AND VIDEOS	12,000	6,400
MAKES RECOMMENDATIONS BASED ON YOUR MOVIE PREFERENCES	YES	NO
VIDEOS AVAILABLE FOR ONLINE PURCHASE*	15,000	NONE

Note: Numbers have been rounded to the nearest hundred. All numbers are approximate and not registered trademarks of their respective companies. *From anywhere within the United States or Canada.

For Windows[®] and Macintosh[®] **\$48⁹⁸**

The PC Zone[™]
Your Catalog SuperStore

1-800-258-2088

US\$ plus applicable taxes



AMC
All-Movie Guide

COREL
1. All movie information is accurate.
2. All movie listings are complete.
3. All movie ratings are correct.

CIRCLE 037 ON READER SERVICE CARD

Explore the Internet **FREE!**

There's something for everyone on the Internet. And now you can get **full access** to this incredible resource without risk. With ten **FREE*** evening and weekend hours on Delphi Internet™.

In 1992, Delphi Internet broke new ground by becoming the first major online service to offer full access to the Internet. Since then, Delphi Internet members have been at the forefront of the Internet revolution.

Delphi Internet connects you to 30 million people and 20,000 networks around the world. Send e-mail. Search online databases. Download free software. "Chat" with people who share your interests.

Never been online? Don't worry. Hundreds of expert online assistants are here to help you get started. You'll also enjoy free, **unlimited** phone support — all part of the most responsive customer support in the industry.

Over 850 local access numbers are available nationwide. So start your ten free* hours today. Call 1-800-695-4005. Or to join directly by modem, follow the instructions at right.

FREE! InterNav™ for Windows™ Join now and we'll send you, absolutely free, InterNav for Windows — the point-and-click software *Windows Magazine* says will "steer you into the fast lane of the information highway."

Coming Soon! Totally graphical user interface. To guarantee you easy access to the Internet's most exciting services, including the WWW, we'll soon introduce a new interface, featuring Netscape Navigator™.



Ten-hour Free* Trial!

For immediate access from any computer:
Dial by modem 1-800-365-4636. Press return until you get a prompt.
At Username, enter JOINDELPHI. At Password, enter PCM895

9,600 and 14,400 bps at no extra charge!

*Free offer applies to new members only. Limit one per household. Offer is valid for a limited time. A valid credit card is required for immediate access. Free time may be used only during the remainder of the calendar month of becoming a member. Telecom surcharges apply during business hours (6 a.m. to 6 p.m. weekdays) via Tymnet or SprintNet and for access outside the mainland U.S. New members must agree to Terms and Conditions of membership when joining. Complete details and other restrictions are provided during the toll-free registration. Delphi Internet and InterNav are trademarks of Delphi Internet Services Corporation. Netscape and Netscape Navigator are trademarks of Netscape Communications Corporation. Windows is a trademark of Microsoft Corporation. You must indicate during the online sign-up that you use Windows in order to receive InterNav software.

©1995 Delphi Internet Services Corporation.

DELPHI
INTERNET™
Questions? Call 1-800-695-4005

particularly considering the speed at which the game moves. The music is fast-paced and fun; it really sets the mood.

The game packs in a whopping 30 missions, each of which concludes when you destroy a reactor and escape through the proper tunnel. Various guns and missiles are strewn throughout the levels, along with a variety of power-ups.

As each mission unfolds, you'll come to hate the evil little enemy robots, mostly because of their creative flair. As you careen down the twisting mine shafts, they ambush you from all angles. Occasionally, it seems as if they're actually coordinating their attacks against you.

If the robots aren't worthy of your wrath, maybe your coworkers are. Descent lets up to eight players go at it over an IPX network. Also, two players can play Descent head to head over a modem link.

Descent has everything you could ask for in a 3-D action game—and more.

—Michael Ryan

Kids

Cause-and-Effect Brain-teasers

The Incredible Machine 2

Sierra On-Line Inc., 800-743-7725.

Circle 498 on reader service card

★★★★★ 

If you like Rube Goldberg and his outlandish machines, you'll love this latest addition to The Incredible Machine series. In this puzzle game, the goal is to create an outlandish machine that ac-

SPOTLIGHT ON ADVENTURE

Johnny Mnemonic

You know how traumatic it is to have your hard disk crash. Now imagine if that crash happened inside your head. That's what it



feels like to be Johnny Mnemonic, a data courier with 320GB of data wet-wired to his brain. In this interactive movie adventure, you must find the download code so that Johnny can dump the data before it kills him.

The plot of Johnny Menmonic is derived from a William Gibson short story, which has also spawned a movie of the same name. What distinguishes this full-motion, video-

based game is that it has no interface. At times, you sit back and watch movie sequences play themselves out. But when the video switches to letterbox format, it's your turn to act. This is considered your Window of Opportunity, and it's the only chance you get to look around, pick up an object, or KO an adversary.

At first, these opportunities seem to pass too quickly. But it takes only a few minutes before you recognize your call to action and dive right in. There are only ten commands to learn for navigating, fighting, and puzzle-solving—and plenty of chances to pursue all of these activities.

The interfaceless approach ensures a seamless gaming experience where you're always part of the movie, and this makes Johnny Mnemonic a game you'll long remember.

—Gayle C. Ehrenman

Sony Imagesoft, 310-449-2999.

Circle 500 on reader service card

★★★★★ 

complishes a mundane task. For example, one machine might drop a soccer ball, which cuts a rope, which releases a balloon, which flips on a laser, which lights a candle, which sets off some fireworks. It's the domino effect with a psychotic spin.

In The Incredible Machine 2, you must find the missing pieces from some already-created machines to make them run. The game includes 175 cranial crunchers, sure to perplex even the fittest of mental gymnasts. A wonderful tutorial introduces you to all of the perverse elements that can make up an Incredible Machine—and we're not just talking ropes and pulleys. Along with the Coffee Pots and Can Openers, there are Anti-Gravity Pads, Nitroglycerine, and Lava Lamps to aid in the

daunting task of, say, turning on a light switch. This highly addictive game comes complete with a wide variety of

credible Machines.

If all this sounds a bit too serious, there's the Incredible Toon Machine (CD-



The objects in The Incredible Machine 2 can be flipped, stretched, and twisted in order to get your machine running.

background music, a two-player mode, and—for players with creative bents—the tools to build your own In-

credible Machine 2 ROM, \$39.95), which calls for you to create machines that wreak havoc on cartoon characters.—Shane Mooney

Abort, Retry, Fail?

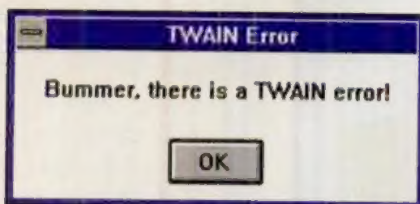
THE LIGHTER SIDE OF PERSONAL COMPUTING

By Don Willmott

His Name Is Neuromancer

"For Sale: Pure Bred cyberian Husky, 1 1/2 yrs. old male. Needs room to run, good home only.—*The Milford (Michigan) Times*

Like this gnarly error message from the Kodak DC-40 camera's Twain driver is really harshing my mellow, dude.



More Fiery Food on the World-Wide Web

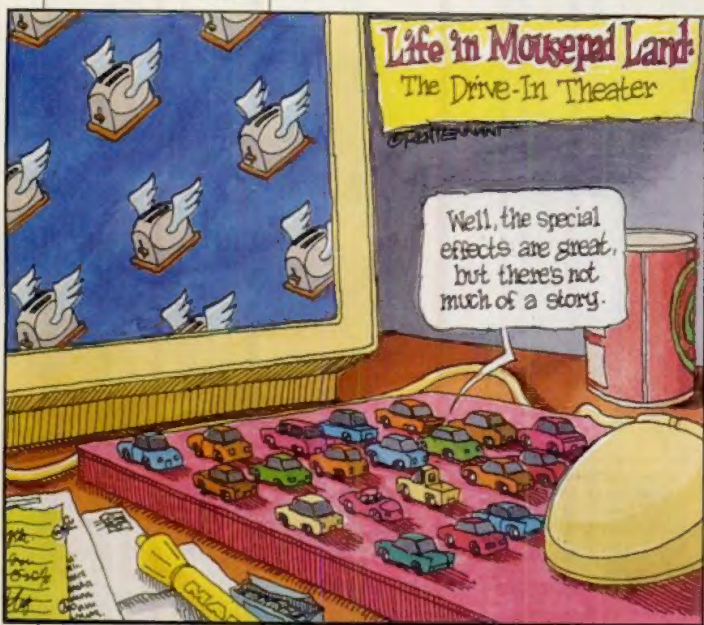
What happens to grapes in a microwave oven? Surf to "Fun with Grapes" at <http://www.sci.tamucc.edu/~pmichaud/grape/> for an analysis. It's as exciting as an exploding strawberry Pop-Tart, and a much healthier snack, too.



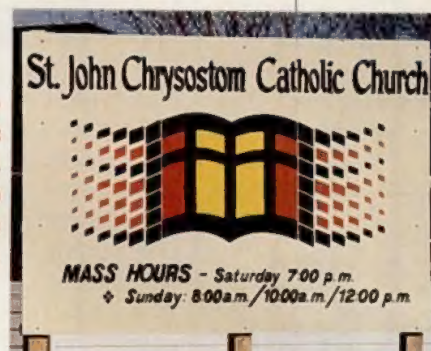
Very funny! Our own Rich Tennant has collected his favorite computer cartoons in "Version 2.0" (\$6.95, Andrews and McMeel; ISBN: 0-8362-1783-7).

File This Under "Gross Understatement"

Here's what Software Toolworks' World Atlas MPC CD-ROM has to say about transportation in Bosnia and Herzegovina: "Roadblocks manned by local militias are numerous. These militia groups frequently confiscate relief goods and trucks, and may otherwise behave unprofessionally."



ARF on the road: Arnprior, Ontario. Hmm, maybe God really is on Microsoft's side.



The Software Publishers' Association Isn't Gonna Like This

"These reports are an invaluable LAN administration resource you can view on-screen, print, or export to another program—such as Harvard Graphics, so you can impress the boss. Most also are approved by the Software Piracy Association (SPA). . . ."—*Computer Shopper*

If your entry is used, we'll send you \$50 and a PC Magazine T-shirt. Send your entries to Abort, Retry, Fail?, PC Magazine, One Park Ave., New York, NY 10016-5802. Winners this issue: Brandon Browning, Barclay Craig, John Melcher, Jr., Ken Murray, and John Schrader.

DELL DIMENSION
Reliable PCs For High
Performance Computing

DELL DIMENSION P75
75MHz PENTIUM PROCESSOR

- Mini Tower Model
- ★ **8MB RAM (128MB Max RAM)**
- 256KB Writeback Cache
- ★ **540MB Hard Drive (12ms)**
- VS14 Monitor (14" CRT, NII)
- 64-bit PCI 1MB DRAM Video
- 3.5" Diskette Drive

- Spacesaver Keyboard/Mouse
 - MS-DOS 6.2/Microsoft Windows 3.1/30 Days Free Support
 - ★ **Add a 3COM Link III Network Interface Card for only \$109 more.**
- Business Lease: \$52/Mo.

\$1399 Order Code #500115



AT \$1399, YOUR P75 JUST CAME IN.

You can now be the proud owner of a 75MHz Pentium processor-based system for less than you or our competition ever thought possible.

Our Dell Dimension P75 includes a robust 540MB hard drive, 8 megs of RAM, and a crisp color monitor. Then, for multimedia and graphics skills, the P75 has 64-bit PCI video performance with 1MB of DRAM.

So, they say good things come to those who wait. And when you call and order today, your wait will be over.

DELL®

TO ORDER, CALL

800-759-1120

In Canada,* call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT

Sun 12pm-5pm CT • <http://www.us.dell.com/>

Keycode #04075



pentium
PROCESSOR

Dell's featured computer artist is Nance Paternoster of San Francisco, CA.

DELL DIMENSION
Reliable PCs For High
Performance Computing

DELL DIMENSION™ XPS P120c
120MHz PENTIUM® PROCESSOR

- Mini Tower Model
- 8MB RAM (128MB Max RAM)
- 256KB Writeback Cache
- 540MB Hard Drive (12ms)
- 15LS Monitor (15" CRT, NI)
- 64-bit PCI 2MB DRAM Video

★ 4X Multi-session EIDE CD-ROM
Drive

★ MS® Office 4.3, MS Bookshelf,
Visio Express for MS Office

- 3.5" Diskette Drive
- Spacesaver Keyboard/Mouse
- MS-DOS® 6.2/Microsoft® Windows®
3.1/30 Days Free Support

Business Lease®: \$89/Mo.
Order Code #500113

Loaded 120MHz

\$2399

IT'S A SMALL PRICE TO PAY FOR POWER.

Leave it to Dell to offer a full-blown 120MHz Pentium chip-based PC before some of the other PC players have even figured out what Intel's latest chips can really do.

So for the same price as last year's P60, Dell now gives you a P120c with double the clock speed. All in a PC built to ISO 9002 standards. And on top of that, from a company that recently took top honors in the *PC World* Reliability and Service Report.

So now you can get the power you need. Without paying the price.

DELL®

TO ORDER, CALL

800-759-0391

In Canada*, call 800-668-3021

Mon-Fri 7am-9pm CT • Sat 10am-6pm CT

Sun 12pm-5pm CT • <http://www.us.dell.com/>

Keycode #04074



Dell's featured computer artist is Nance Paternoster of San Francisco, CA.

**intel
inside**
pentium
PROCESSOR